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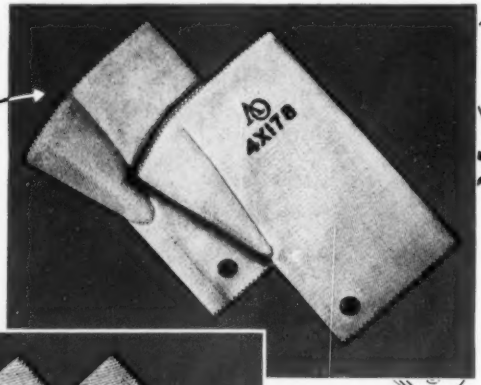

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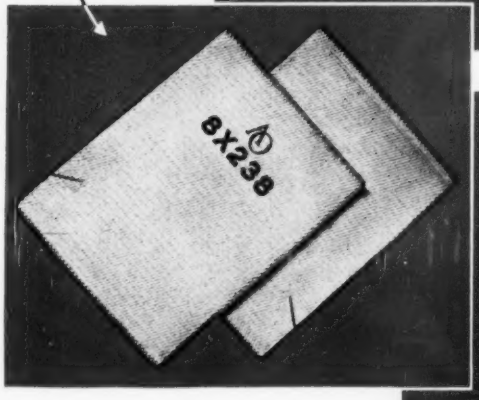

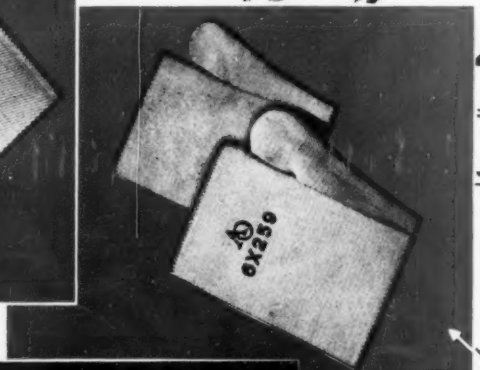

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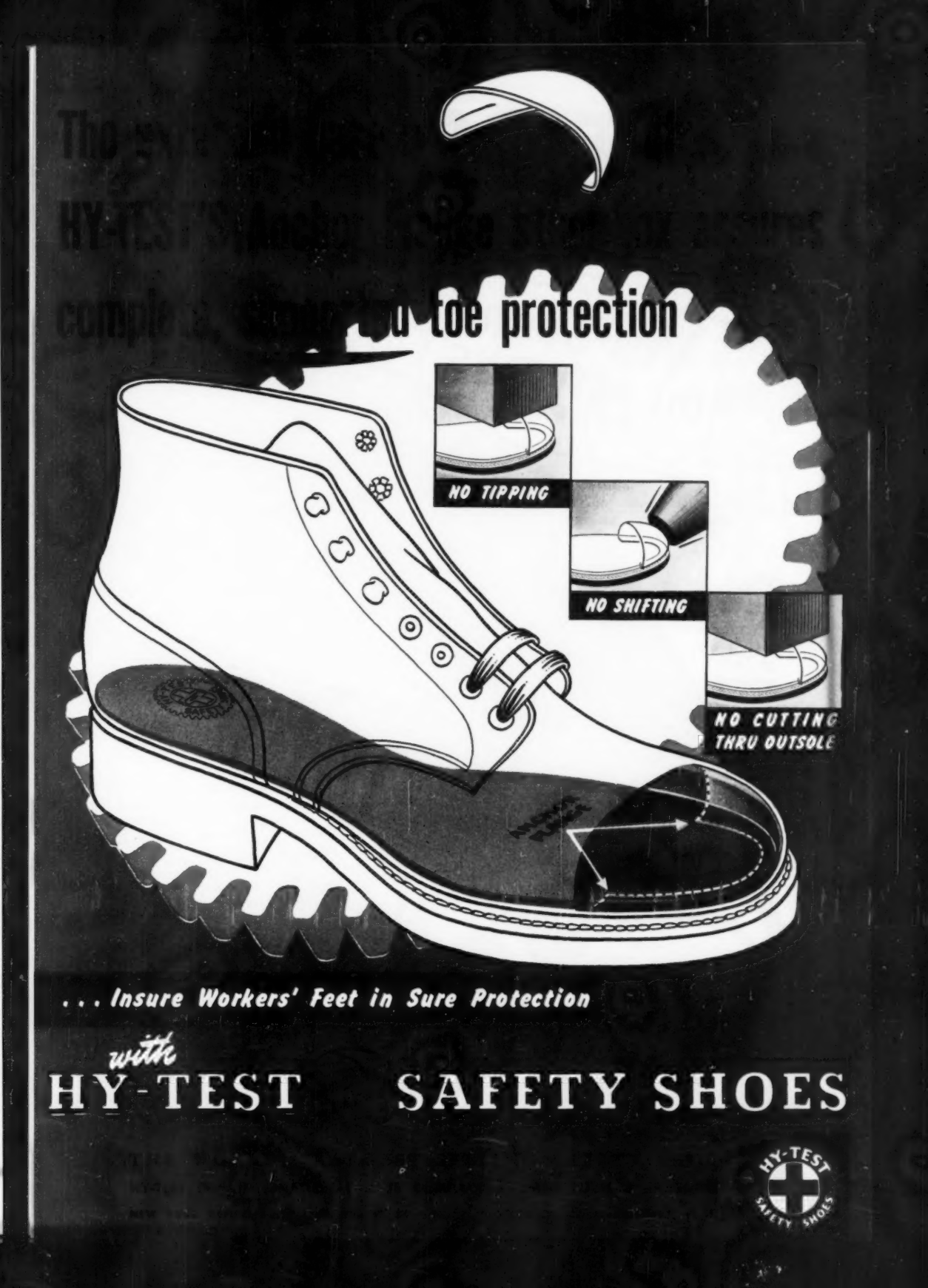

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FREE ***to work better, faster, more safely!*** • The exclusive advantages of CESCO's new #600 AIR-FED HOOD are bound to increase worker comfort, safety, and output. It is ideal for lead discing and other grinding operations, light sandblasting, paint spraying, etc. Write for more detailed information or see your Cesco Distributor.

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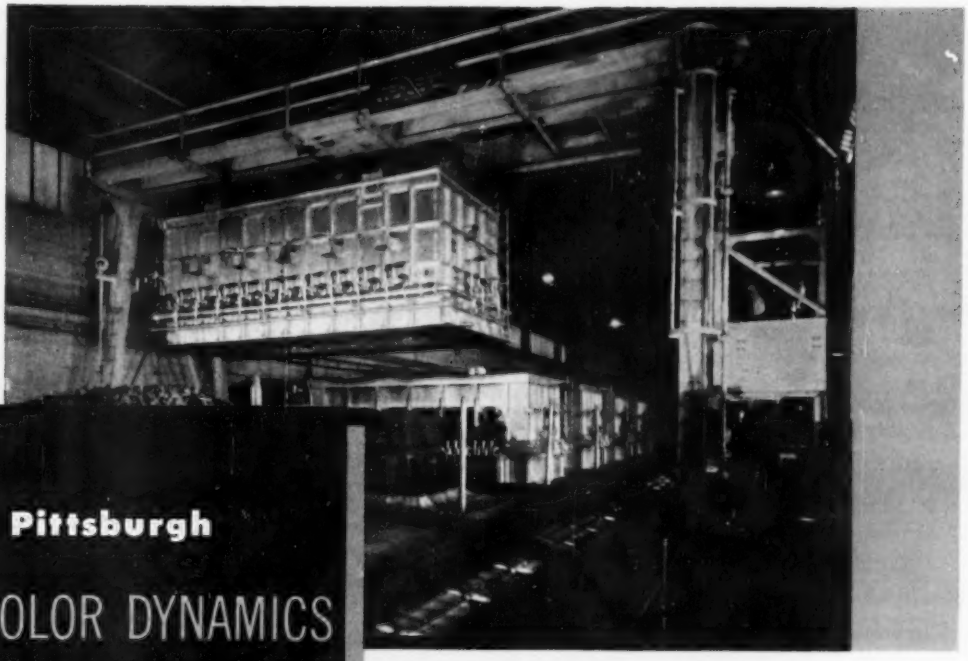

Pittsburgh COLOR DYNAMICS contributes to improved operation of a model iron foundry

Albion Malleable Iron Foundry utilizes energy in color to make its huge 62-year-old plant a more efficient, more attractive and safer place for its workers.

PRODUCTION executives in almost every branch of industry today eagerly seek out and investigate every development that will aid them to build more and better goods at lower cost. That's why so many are using Pittsburgh COLOR DYNAMICS to repaint plants and equipment.

● **By actual experience** they have learned that this new system of painting—based upon the scientific principles of the *energy in color*—invariably results in more efficient and more economical production.

● **Characteristic of such experience** are the results achieved with COLOR DYNAMICS by the Albion Malleable Iron Company, of Albion, Michigan. During the past year this 62-year-old plant has been modernized in appearance as well as in manufacturing methods and processes until today it stands as a model for its entire industry.

● **"Recognizing** that proper painting can be the visual expression of the progressive attitude of an organization," writes T. T. Lloyd, Vice-President of this company, "we decided to color engineer our plant according to COLOR DYNAMICS. We selected colors that would improve working conditions in all departments throughout the plant and offices.

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● **"Important as these** direct results of COLOR DYNAMICS are to management and workers alike, of equal importance to our company have been other long-range benefits. The improved appearance has increased good will and respect in our community. The cleaner, better-lighted and pleasanter plant attracts a higher type of worker both for executive and production jobs.

● **"Visitors, too,** have been favorably impressed by our modernization program. Among these have been many current and potential customers whose confidence in our ability to produce quality castings in large volume has been strengthened."

Let us make a COLOR DYNAMICS Engineering Study of your plant—FREE!

● **Why not try** COLOR DYNAMICS in your plant—on a machine or two, or in one department—and see the difference it makes? We'll be glad to make a scientific color engineering study for you FREE and without obligation. Call your nearest Pittsburgh Plate Glass Company branch and arrange to have our COLOR DYNAMICS representative see you at your convenience. Or mail the coupon.

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MODEL 9 "Blackout" plastic frame. Medium bridge size. Model 29 — large bridge size.

MODEL 10 Transparent green plastic frame. Medium bridge size. Model 210 — large bridge size.

MODEL 10G2 Transparent green plastic frame and green Impax* plastic lens. Medium bridge size. Model 210G2 — large bridge size.

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MODEL
511CSS

Standard Tuc-Away* frame shown with Regular Side Shield lenses, for use where only partial side protection is required. (Frame is also available with plastic club temples: Model 510.)

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Publication Office: Box 1259, Albany, N. Y.
Editorial and Advertising Offices:
BEST Building, 75 Fulton St., New York 7, N. Y.

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SAFETY MAINTENANCE & PRODUCTION

FORMERLY "SAFETY ENGINEERING"

The Magazine of Safety
Reg. U. S. Pat. Off.

A MONTHLY PUBLICATION DEDICATED TO ACCIDENT PREVENTION, MAINTENANCE, HEALTH CONSERVATION AND FIRE CONTROL FOR EFFICIENT PRODUCTION.
EST. 1901

VOLUME 100, NO. 5 NOVEMBER, 1950

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Our Thanks for the Courtesy
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AMERICA'S PIONEER MAGAZINE IN ITS FIELD

SAFETY MAINTENANCE & PRODUCTION is indexed regularly by Engineering Index, Inc., New York

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*T. M. REG.

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It's Safe to Say

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★ STEPCHILDREN OF SAFETY

OF ALL the agencies working for the advancement of safety through the medium of accident prevention and good maintenance effort, only the various state labor departments are vested by law with police power to enforce regulations.

In other words, the state departments are given not only the responsibility for establishing safe working places but can prosecute whenever a plant manager refuses to provide the required safeguards. In view of that fact, they should be the strong arm of the safety movement in the opinion of Miss Marion Martin, State Labor Commissioner of Maine.

In an illuminating address before the National Safety Congress in Chicago late last month, Miss Martin charged industry with relegating state labor departments to the position of stepchildren of safety by being in the middle between labor and management, between management and insurance companies, between safety engineers and foremen, as well as other interested groups.

It would seem that rarely is the big stick wielded in behalf of accident prevention, for the reason that labor departments of the various states are too often handicapped by the lack of moral support and lack of finances.

Obviously, if this be true, it is a problem that cries aloud for early solution. Miss Martin visualizes the ideal condition where every employer and employee are doing such a perfect job in accident prevention that no governmental bureau—local, state, or national—need be brought into the field. Until that Utopian day, however, the governmental agency closest to the plant is the state department of labor, which, the speaker warned, must be encouraged to fulfill its obligations honestly and impartially.

This is no attempt to foster "statism" or the "welfare state" upon a society burdened with the weight of bureaucracy. Nor does a state body vested with authority to deal with accidents and responsibility for their control imply any interference with our blessed system of free enterprise. Rather, the support of our state agencies is intended to implement the priceless contributions of insurance companies, management and labor organizations to cut down the toll of accidents.

According to Miss Martin, the State of Connecticut has a new approach to cooperation with management, labor and the insurance fraternity. The industrial safety work is in the hands of two groups of experts—the safety consultants and safety inspectors. The former visit the plants and through advice, attempt to convince management voluntarily to make needed corrections. If they find an adamant plant owner—and that breed happily is fast disappearing—who fails to provide the needed safeguards without compulsion, inspectors of the state department follow up the report and their recommendations are bulwarked by power of prosecution.

We must make of state departments partners, not policemen, to achieve the ultimate results in accident prevention and control. You can guard a machine to the hilt, maintain the floors and achieve the zenith in good housekeeping, but it serves no purpose if, two hours after the inspector's visit, the plant is cluttered and dirty, machine guards are removed and the personnel is allowed to become slipshod in their safety effort.

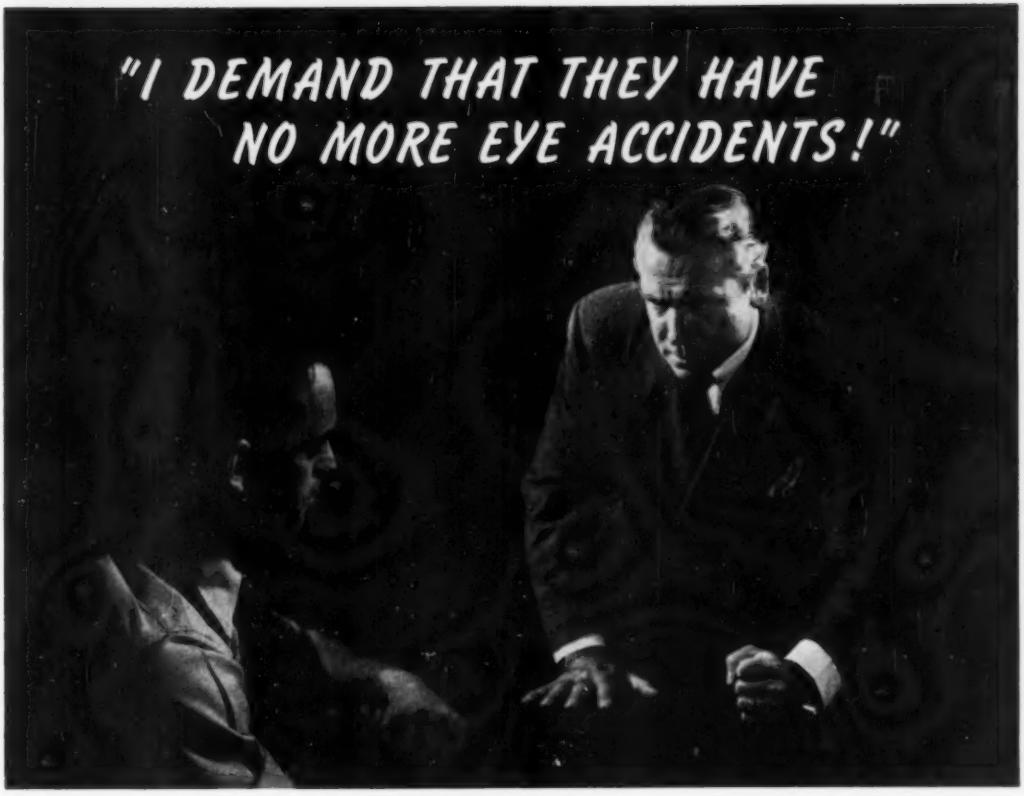
The speaker emphasized with good reason that safety is a goal achieved through cooperation and that a partnership in which all the best elements of insurance, management, labor and the various state labor departments will steer our working forces away from the twin shoals of accidents on one side and excessive demands of government on the other. The forward-looking state will guard against that latter risk by avoiding such demands that a plant would be forced to close its doors, bringing chaos to the lives of the workers. The state, according to Miss Martin, need not be an ogre and should not be a stepchild.

★ BARKING AT THE MOON

IT IS very apparent that some publications have not recognized what all industry has affirmed—that safety plus maintenance equals production. One such paper has seen fit to attempt to undermine advertising confidence through a deliberate misconception of a considered approach to the enlargement of the safety influence on all American production.

What a limited view point! What a small horizon!

H. A.



1 SELL EYE SAFETY TO EMPLOYEES
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2 SAFETY GLASSES FOR EACH JOB
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3 PROTECTION *PLUS* CORRECTION
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In fire protection equipment, the best is none too good. Accordingly, Ansul engineers conduct continuing research for improving Ansul Extinguishers and Dry Chemical. Ansul Quality has set a high standard for newcomers in the dry chemical fire extinguisher field. This unparalleled standard of quality is constantly being raised by Ansul research and development.

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SAN FRANCISCO, CALIF.—E. D. Bullard Co.
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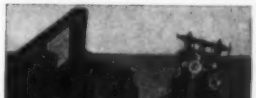

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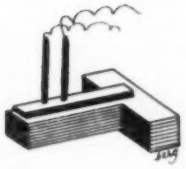
SAFETY MAINTENANCE & PRODUCTION
VOL. 100, NO. 5 • NOVEMBER, 19 0

Protecting the plant and the worker



By H. E. BEAVEN *

To be productive, a factory's machines, materials and methods must be designed and maintained for the safety of the worker. Management must recognize its ultimate responsibility and delegate the necessary authority down the line.

FOR every manufacturer continuity of production and the retention of markets depend on the protection of his plant and of his workers. Destruction or crippling of plant facilities by fire or explosion has high probability where there is little thought given or provision made to safeguard and protect against such occurrences. Similarly unless positive action is taken to protect the worker from both the inherent and the unusual hazards of his job there will be frequent temporary or permanent loss of trained and skilled workers who become injured or crippled or who decide that they do not want to work in such an industrial slaughterhouse.

The prevention of loss in industry from fire or from accident resulting in injury to the worker, just as in the control of other waste and loss, is fundamentally an industrial or management engineering problem. Thus protection of plant and protection of the worker cannot be left to chance or considered to be a notional matter and outside the ordinary realm of plant management, subject purely to the whim of those in charge. The first step in the protection of plant and protection of the worker is a declaration of policy by top management:

1. The plant shall be so constructed, maintained and operated that there shall be no loss by fire or explosion.
2. Production shall be without injury to any worker.

Having established and published this policy, top management must definitely assign responsibility and authority to the operating organization to carry out the policy. The protection of plant and the worker must be placed within the scope of responsibility of each individual in the plant. It is lack of recognition of this fundamental that often leads to serious damage to plant and/or injury to the worker. While the responsibility for technical knowledge of plant and worker protection may be functionalized and assigned to appropriate staff members, the operation of the programs must be an integral function of the line organization, carried down to the worker himself by his own supervisor.

* Mr. Beaven is the Engineering Manager of the New England division of a leading insurance company.

Plant Protection

Actually of course, the very housing of the plant is for the purpose of protection. Modern design follows the principle that the building be a shell, or envelope in character, to enclose the machinery, other process equipment and the necessary work space in order to protect them from the elements or other interfering forces such as trespassing members of the general public. The hazard of fire has such great potentiality of total loss that in any discussion of plant protection it must receive studied consideration.

Protection of the plant against the ravages of fire requires intelligent consideration of the prevention of fire as well as the facilities and knowledge to extinguish the fire after it starts. Among the many things which need to be taken into account are the sources of ignition and those materials and processes which are highly flammable or require the handling of materials which sometime in their processing may increase the fire hazard.

For a recent year, and in the order of the number of fires involving them, analysis of National Fire Protection Association fire records reveal the following as the key factor in the majority of fires in the United States: 1. Smoking and matches. 2. Defective and improperly used electrical wiring and equipment. 3. Defective and uncontrolled heating equipment. 4. Defective and overheated chimneys and flues. 5. Lighting. 6. Flammable liquids. 7. Rubbish.

The National Safety Council states that the majority of fires in industrial property can be traced to four general causes: (1) open flames and high temperatures, (2) friction, (3) electricity, (4) chemical reactions.

Fire Prevention

Prevention of fire is influenced favorably by fire resistant construction, good housekeeping, storage facilities for flammable or combustible materials adapted to the special hazard involved, and design of process with recognition of the fire hazard and provision to control it.

Buildings themselves should be constructed in accordance with the use to which they will be put. Fire-resistive construction will provide the protection for expensive machinery, costly materials, and work in process so that in the event of a fire's starting in any part of the building it may be localized and extinguished without extensive damage. It should be pointed out and reemphasized that limitation of areas by fire walls, enclosure of floor openings, or use of separate structures in order to limit values in any one enclosed area is an excellent basic principle of protection against fire loss.

By good housekeeping we mean, "a place for everything and things kept in their place." Rubbish and waste must be removed frequently and regularly. Safe storage facilities are requisite to good housekeeping, i.e., ventilated fire-proof enclosures for paints, lacquers and their thinners; drying oils and oily rags subject to spontaneous ignition require isolation in closed metal containers.

Processes involving dusts and flammable vapors or gases require local ventilation to keep concentrations below the lower explosive limit and to prevent the accumulation of dust on surfaces from which they may be thrown into the air. All organic and many metallic dusts are explosive when suspended in the air. They also require isolation and insulation or grounding to prevent ignition from open flame, heated surfaces, static or other electric spark.

Fire Extinguishing

Although the prevention of fire is a prime objective in any program of plant protection, the prompt extinguishment of a fire must be provided for. The program must then include the following items:

1. Relations with the public fire department. Where there is a community fire department it should have a prominent place in fire protection. So that it may be able to render its best service, this local fire department should be made familiar with the plant and its special process and materials problems. These may influence fire fighting methods.

The contents of any building may burn, and even in fire-resistive construction, the heat from such burning may be so intense, if allowed to continue for any length of time, as to harm or destroy the building itself. Thus, there needs to be means of extinguishing fires as soon as possible after they start.

2. First aid fire equipment. The first few minutes are usually vital in keeping fire losses to a minimum. First aid fire fighting equipment in the hands of instructed employees can be invaluable. Such hand extinguishers should be located within 50 ft. of expected point of use and should be fitted to the type of hazard. Class A fires involve wood, paper and similar combustibles. Class B fires comprise oils, grease and paints. Class C, concern live electrical equipment. Class A extinguishers are essentially means of wetting down the combustible. Class B extinguishers blanket the flammable material and eliminate oxygen contact. Class C extinguishers are similar to Class B except that water or other electrically conductive material must not be contained.

3. Automatic sprinkler and alarm system. The automatic sprinkler system properly installed and with ample water supply is recognized as a highly effective means of preventing heavy fire loss. A sprinkler system needs to be designed in accordance with recognized hydraulic principles. It should have ample pipe sizes and a well planned distribution of sprinkler heads so that the flow of water may be adequate to meet the needs of fire extinguishment in any portion of the building. Such a system will recognize *(To page 51)*

By CAESAR J. BRIEFER
Electric Cord Company
New York, N. Y.

Emergency "EXIT" lighting unit operated on a dry battery. Unit can be plugged in or wired into electrical system.

Emergency Lighting for the Atomic Age

Why is emergency lighting more important than ever today?
How can the lighting units be used to best advantage?
What types of emergency lighting equipment are available?

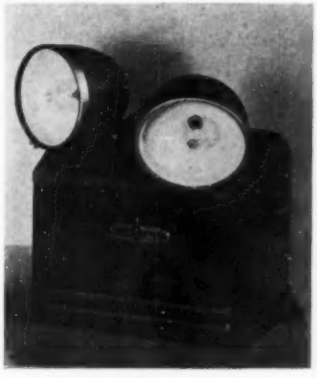
As this article goes to press, a press release dated October 12, 1950 has been issued by Colonel Laurence Wilkinson, Director of the New York State Civil Defense Commission, the first paragraph of which reads as follows:

"In case of real or threatened emergency, when it might be necessary to shut off public utilities in any part of a city, the turning off and on of gas and electricity in specific localities will be handled by the local public utilities themselves, on instructions from Civil Defense Officials."

Since it is evident that many other states in critical areas will also adopt this procedure, the necessity for auxiliary emergency lighting in places of public assembly now takes on a new significance.

THE need for auxiliary emergency lighting has always been present. Disturbing world conditions bring this need more clearly into focus and increase its immediacy. Responsible officials in the various government departments, civilian defense, defense plants, department and chain stores, hospitals, theatres, factories, etc. are currently installing emergency lighting equipment or have it high up on the procurement agenda. Many states recognizing the need for protection of the public in places of public assembly have passed laws making it mandatory to install automatic emergency lighting equipment.

This interest in automatic emergency lighting equipment at this time is understandable and justifiable. Pick up your morning newspaper and the headlines read, "Government Officials Advise Industry To Guard Against Sabotage," "Washington Makes Plans To Decentralize Government Offices," "Civilian Defense Officials Say Panic Is Our Worst Fear In The Event Of An Atomic Attack." In this era of the cold, and not so cold war, people are so emotionally keyed up against sudden disaster that a fire in the New York Subway, an explosion in Perth Amboy, an explosion of a manhole cover in Brooklyn, brought forth cries of "war," "enemy planes," "bombs." In each case, panic broke out. Responsible officials recognize this dangerous emotional state on the part of the public and realize that the prevention of panic is a matter for most serious consideration.



Portable wet-battery lighting unit.

Can you imagine what would happen in the crowded basement of a department store if it were suddenly plunged into the blackness of a power failure? Or if such failure occurred in one of our crowded night clubs or during the performance of a Broadway play? Or in one of our large industrial plants where thousands of employees are at work? How many times have you read in newspapers, "Lights Out In Hospital, Doctor Performs Emergency Operation by Flashlight"? At times, communities, even whole cities, have been without electricity, because of conditions beyond the control of the utility companies. Power *(Page 41)*

FEATURE

HOW TO PUT OUT

This is the third of a series of five major articles dealing with Fire Protection. The next two articles will appear in the December and January issues of SAFETY MAINTENANCE & PRODUCTION.

When is a class "C" fire not a class "C" fire?
What types of extinguishers are suitable for class "C" fires?
Where can these various types be used to best advantage?

An electric motor fire being extinguished with a five-pound size carbon dioxide extinguisher.

IF FIRE extinguishers had been in general use one hundred years ago, there would have been no need for a class "C" fire extinguisher in those days. The reason is, of course, that the hazard of class "C" type fires had birth with our great electrical industry and has grown as a part of it. Before the use of electric power, it was not necessary to have an extinguisher which could be safely used in the presence of equipment handling large electric potentials.

As may be surmised, class "C" fires involve those fires in which electricity is a hazard. The distinction between class "A", "B", and "C" fires is that a class "A" fire indicates the use of a wetting agent, such as water, that can be used in extinguishing materials like paper, wood, and textiles. Class "B" fires, on the other hand, include substances such as gasoline, oils, and greases. The class "B" fire is generally extinguished by both smothering and cooling. It is to be noted that in both class "A" and class "B" fires, the manner of extinguishment is indicated by the material which is burning. In the case of the class "C" fire, however, the burning material may be of either class "A" or class "B" nature, but it is the fact that an electrical potential is involved which determines the method of extinguishment. As soon as the electric current is shut down, the fire no longer remains a class "C" fire, but then may be extinguished by any extinguisher which is capable of handling a class "A" or class "B" fire, depending upon the nature of the burning material.

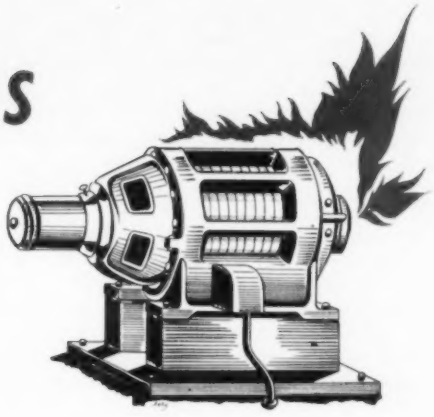
Generally speaking, the class "C" fire must be handled as such. In the case of incipient fires, it is frequently necessary to combat the small fire before the current can be turned off. If sufficient personnel is available, usually the two operations of simultaneously fighting the fire and turning off the electric current can be handled effectively. However, as we are primarily interested in extinguishing the fire, regardless of whether the electric current is flowing or not, it is well to consider the various types of fire extinguishers and means of extinguishment which are available for this type of fire. Fundamentally, the extinguishing agent involved must be a *nonconductor of electricity.*

Using a vaporizing liquid extinguisher on a fuse box fire.

Vaporizing Liquid Extinguisher

The first and oldest type of unit used for this purpose is the vaporizing liquid extinguisher, which has now been in use for several decades. The liquid in these extinguishers is somewhat wetting in action and for practically all purposes is a nonconductor of electricity. These extinguishers are also given a class "B" rating because of their established ability for extinguishing fires involving gasoline, oils, and greases, which require a smothering or cooling action. Additionally, on small

CLASS C FIRES



By R. S. ERICSON, Chemical Engineer
The General Detroit Corporation
Detroit, Michigan

fires, of class "A" origin, the vaporizing liquid extinguisher might be used to some advantage. This is usually the case where the wiring in an electric motor or control panel may be on fire. Vaporizing liquid extinguishers are very effective in this type of application. Although the wetting action of vaporizing liquid is considerably less than that of water, it is still the best unit to use where class "A" material is involved with a class "C" hazard. The exception to this would be the use of water fog, which is at present, not available in a first aid type fire extinguisher.

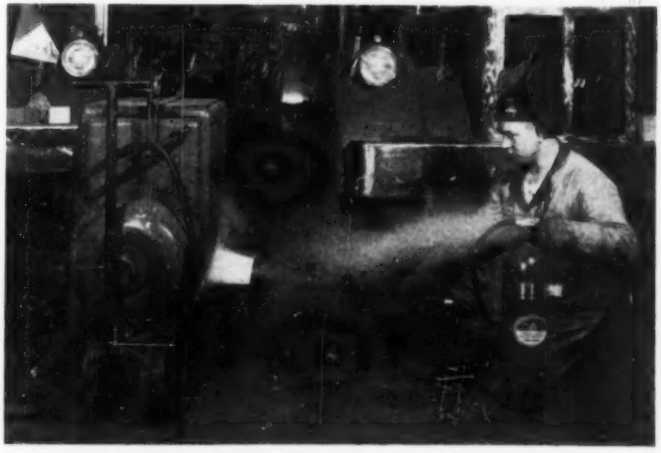
Carbon Dioxide Extinguisher

A second very effective type of fire extinguisher for class "C" fires is the familiar carbon dioxide unit. The CO_2 extinguisher, since World War II, has been used to a greater extent on class "C" fires than has probably any other extinguisher. This unusual fire extinguishing chemical is the cleanest means of fire extinguishment which is available. Carbon dioxide has the peculiar characteristic, that after once being applied to a fire, it dissipates itself entirely as a gas, thus leaving absolutely no residue. Its extinguishing ability, as was demonstrated very advantageously during the war, is of first importance. Whereas vaporizing liquid requires the transformation of the liquid into the gaseous form before it may be used effectively as a diluent to reduce the oxygen percentage of the air, carbon dioxide for the most part is discharged directly as a gas which dilutes the percentage of oxygen in the atmosphere to a point where it will no longer support combustion. Even that portion of the carbon dioxide which is not discharged as a gas, is discharged as a "snow" which sublimes directly from the solid state into the effective gaseous carbon dioxide.

Ordinarily, oxygen is present in the atmosphere on the order of 21 percent. Fire can "burn" very effectively in this percentage of oxygen, and will continue to do so until the percentage of oxygen is reduced to approximately 15 percent.

Extinguishing agents may be considered from several aspects. One of these is in respect to their cooling abilities. Another involves the wetting capacities of each of the extinguishing agents. For instance, vaporizing liquid does have the ability to wet a material to a certain extent. This ability is considerably less than that of water, but because of the non-conducting nature of the fluid, it does have a considerable advantage as an extinguisher of class "C" fires involving class "A" material. Carbon dioxide, on the other hand, has practically no wetting ability and depends almost entirely upon its cooling and diluting action.

An extinguishing agent which acts in a cooling manner needs to be considered in a true light as to its actual total cooling capacity, and also in conjunction with its



A fifteen-pound size carbon dioxide extinguisher being used on a fire in electrical equipment.

other extinguishing properties.

As mentioned, vaporizing liquid may extinguish both by *wetting*, and by *diluting* of the oxygen to a point where the atmosphere will no longer support combustion, whereas carbon dioxide must extinguish by *cooling* and by *diluting*.

Considering the cooling properties of the three materials: water, vaporizing liquid, and fire extinguisher carbon dioxide, it should be noted that it requires approximately 1100 B.T.U. to raise one pound of water through the temperature range from normal temperature through vaporization. Vaporizing liquid, on the other hand, requires only about 85 B.T.U. to be carried through the same process to vaporization. Therefore, it can be seen that the cooling ability, or in other words, the ability to extract heat from the burning material, is approximately 1/10 or less for vaporizing liquid than it is for water. However, regardless of this fact, it must be remembered that vaporizing liquid has the ability to be used in contact with high potential electric current, whereas water, except in water fog sprays, cannot be used for such purposes.

Fire extinguisher carbon dioxide as discharged from the extinguisher has the ability to absorb approximately 180 B.T.U. per pound of extinguishing agent. This is more than twice the cooling capacity of vaporizing liquid per pound but is still considerably less than that of water, which is the most effective cooling extinguishing agent which is available.

Each fire hazard, however, must be considered as to the matter of extinguishment which will be most effective at the time of fire. Both vaporizing liquid and carbon dioxide have the ability to produce a gas which will dilute the atmosphere to a point where it will no longer support combustion. If this manner of extinguishment is of first importance, as it usually is in class "B" type fires, each extinguishing agent should thus be considered as to its merit. As mentioned before, carbon dioxide for the greater part, is issued from the extinguisher as a gas which may be used directly as a diluent in the atmosphere and thus reduce the oxygen content to a point where it will no longer support combustion in that immediate area. Vaporizing liquid, on the other hand, must be converted first from a liquid, by means of the heat generated by the fire, to the gaseous state before it can be utilized as a diluent. Some times this occurs very quickly, as is the case when vaporizing liquid is applied directly to a very hot surface. At other times the conversion is only partial, because of insufficient heat at the point of the fire. Under these circumstances the vaporizing liquid is probably of greatest value as a wetting agent, rather than as a diluting gas in the atmosphere.

As a very approximate figure, one pound of carbon dioxide extinguishing agent may be considered as sufficient to protect 16 cubic feet of enclosed area in regard to fire protection. This figure is based upon the diluting effect of the carbon dioxide in the atmosphere contained in this cubic content of space.

Naturally, the relative sizes of the vaporizing liquid and carbon dioxide extinguishers will largely determine the application for which they are used. Vaporizing liquid extinguishers are generally available in one quart, 1½ quart, 1 gallon and larger sizes. Carbon dioxide extinguisher, on the other hand, vary in size from 2½ pound up to 100 lbs. cylinders.*

Dry Chemical Extinguisher

An extinguisher, which more recently than the other two has received considerable attention as a unit for class "C" protection is the Dry Chemical type extinguisher. Dry chemical is an extinguishing agent which *(To page 45)*

* In referring to extinguishers approved by the Underwriters' Laboratories, each unit is approved with both a letter and usually a number designat on. The letter refers to the type of fire on which the fire extinguisher would be used. For instance, class "A" type extinguishers, which are used on ordinary combustible materials, are marked on the name plate of the extinguisher with the letter "A", usually followed by a numeral 1 or 2. In the case of those units which are suggested for use on class "B" fires, a letter "B" is included on the nameplate of the extinguisher. Those units which are meant for class "C" protection are also lettered in the same manner. Some extinguishers may combine two types of fire protection, as is the case with the units herein mentioned. Each is rated with a "B" and "C" classification, followed in turn by the numerals "1" or "2" depending upon their size. The numeral "1" stands for one unit of protection and is generally regarded as sufficient protection to cover 2500 square feet of area. Under special hazards this area may be considerably reduced to require 1 unit of protection. When the number "2" is found on the extinguisher in conjunction with any of the three mentioned letters, it indicates that two such size extinguishers are needed to provide protection for one unit of area.

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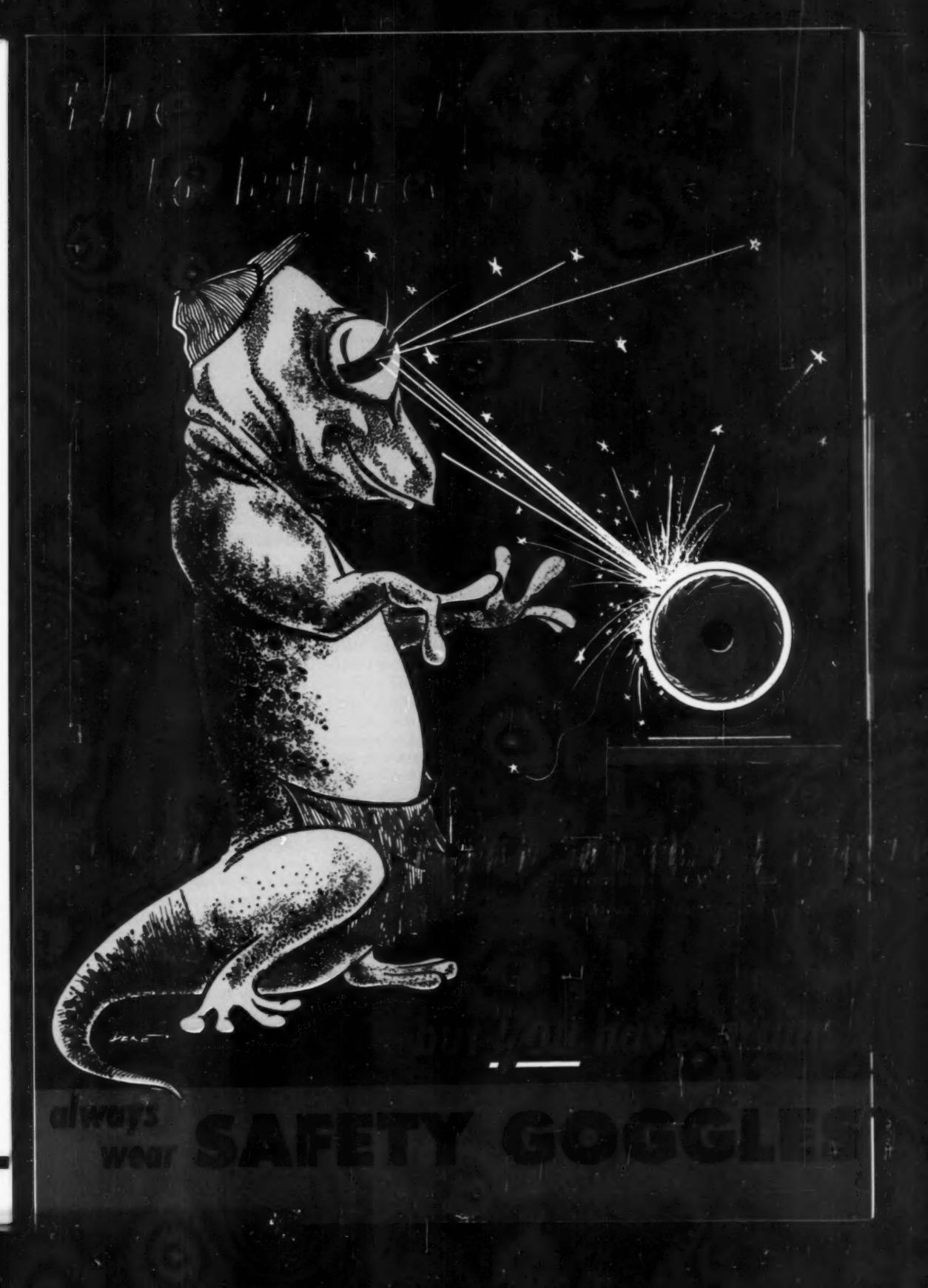

always
wear SAFETY GOGGLES

A display of safety shoes at the sale helped workers select the style of shoe to fit their needs and likes.

Cumberland, Md. plant of the Celanese Corp. of America.

SAFETY SHOE SALE

A Case History

By M. W. WORK, Safety Engineer
Celanese Corporation of America
Cumberland, Maryland

IN CASE you believe you cannot get your employees to buy safety shoes the experience of my company in this respect may change your mind.

The Celanese Corporation of America is one of America's leading producers of textiles, chemicals and plastics. At the Cumberland plant there are as many as 5,000 to 6,000 workers employed at one time, and each and every employee is considered potential "accident bait" all the time he is at work.

This means that constant effort is exerted to keep supervision and workers alert to the dangers that are lurking in every operation.

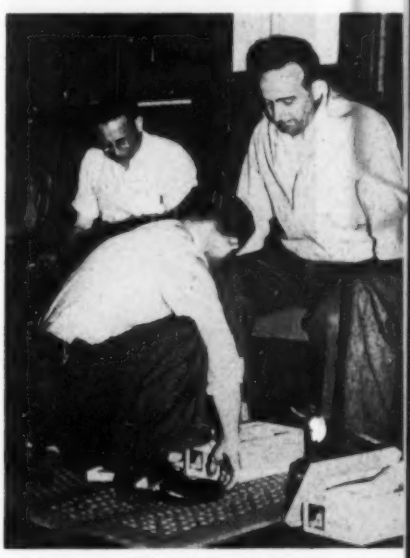
In certain operations, foot and toe injuries are one of those constant dangers. Just suppose one of the girls is doffing a Downtwist machine, which would be removing full bobbins of yarn from the machines and replacing them with empty bobbins. These girls are very carefully trained.

The girls know the hazards of the job, and since each bobbin weighs approximately 5 to 5½ lbs., they are constantly warned to grasp full bobbins firmly. It will happen occasionally, however, that one of the full bobbins will slip from a girl's hands, and fall to the floor, or strike her on the foot or toe. It is known that one of these bobbins, striking in the wrong place, could cause a fractured toe.

Another hazard could be in the use of large 70 lb. drip pans which catch the drain from the presses and machines. If an employee should drop a corner of the pan on his toe, it would probably result in a fractured toe.

Actually the plant's experience in toe and foot injuries has been very good, and much of this credit is due to exacting job-safety analysis and the constant safety training of the employees by the supervision. But the potential foot and toe injury was present in many places.

As a preventive measure it was decided to do a selling job on safety shoes before running into an increase in frequency *(To page 46)*



Business was more than brisk at the safety shoe sale. 1600 pairs were sold in 81 hours.

FEATURE

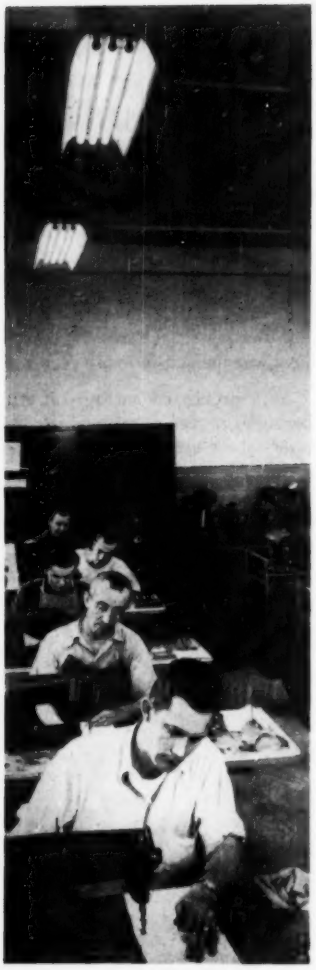
This is the first of four feature articles concerned with Protective Clothing. The next three articles of the series will be published in the December, January and February issues of SAFETY MAINTENANCE & PRODUCTION.

Overhead lighting which provides a uniformly distributed level of 40 foot-candles at the work surfaces actually speeds inspection work in the small parts milling machines department of a new factory in Bridgeport, Connecticut. According to foremen, the rows of three-lamp fluorescent lighting fixtures extending the length of the factory on eight-foot centers both lengthwise and crosswise, effect a substantial saving in time. Formerly, it was necessary for operators to move over to bench lamps to inspect their work. With sufficient and properly distributed overhead lighting, this is no longer necessary. The wires visible in this photograph will be enclosed in conduit.

Planned

How does modern lighting aid SAFETY?
How does modern lighting aid MAINTENANCE?
How does modern lighting aid PRODUCTION?

By D. P. CAVERLY
National Accounts Engineer
Sylvania Electric Products, Inc.



For job-testing and adjusting the sewing machines of a new Connecticut factory, the 40 foot-candles of light evenly distributed over the surface of the work tables from the three-lamp industrial fluorescent units eliminates the need for space-consuming portable desk lamps, leaving the tables clear for tools and other accessories. Wires will be enclosed in conduit before installation is completed.

SINCE it is now widely recognized that good lighting is as essential to industry as production machines, the design of a fluorescent lighting system is an important technique in itself. Provisions must be made in the blueprint stage for providing adequate wiring, well-placed outlets, and a suitable mounting arrangement for fluorescent fixtures.

One of the most practical and successful methods of installation, which requires sound planning, is fluorescent continuous-row lighting, where long rows of fluorescent fixtures provide employees with a uniformly distributed level of comfortable, glare-free illumination. Many plants are able to use this type system because of the standardized fixtures which are readily adaptable to almost any plant layout, the wireways being provided by joining these fixtures end to end. In other plants where the ceilings or type of operation are not suitable for continuous-row lighting, fixtures can be placed sufficiently high to avoid interference with factory tasks, yet maintain an excellent degree of general illumination.

Fluorescent lighting has also been found to be the answer to the lighting problem in plants where the tendency has been to eliminate windows and to control temperature and humidity conditions by air-conditioning. The actual heat generated by fluorescent installations is less than one-half that produced by an incandescent installation providing a comparable level of illumination. The radiant heat, real criterion of human comfort under artificial illumination, is only about one-quarter that of an incandescent light source of equal lumen output.

But what of the daylight lost in a windowless plant? In reality, it is not a serious loss because in a typical factory, 80 to 100 feet wide, natural daylight reaching the center of the factory area amounts to only one or two foot-candles or even less. Fluorescent lighting is the only answer for uniform distribution over large working areas, and since it is the most practical of all present-day illumination methods in most instances, provides 24-hour, all-season, constant illumination economically.

Yet, fluorescent lighting cannot do the whole job. Illuminating engineers realize that many factors which would seem to be remote

The mailing and shipping operation of a new Connecticut factory is performed under the same three-lamp industrial fluorescent lighting fixtures as used throughout the five floors of the building. This high-level, evenly distributed illumination speeds shipping room activities because addresses can be identified quickly and easily. The fixtures contain 3500° standard white fluorescent lamps. These units were chosen in part because they permit simplified maintenance: the reflectors have open ends for easy removal, replacement and relamping. The porcelain enamel finish of the fixtures further aids cleaning since this type finish is easier to clean than paint.

Lighting

FEATURE

This is the second of a consecutive series of three major articles dealing with Industrial Lighting. The next article of the series will appear in the December issue of SAFETY MAINTENANCE & PRODUCTION.

from the lighting problems actually are quite important to the overall success of an installation. Colors of machines, walls and ceilings at one time were not considered with the selection of the light source. However, since light reflecting and light absorbing surfaces are directly related to the type of illumination installed, there has been a gradual realization that loss of light, worker eye fatigue, pleasantness of surroundings and true color analysis of the product are dependent upon a correlation of good lighting and correct surrounding colors. In this respect, when attention is paid to the reflection and absorption factors, it is possible to make full use of the seven fluorescent lamp "white" colors. Correct selection of fluorescent lamp color is dependent to a considerable extent on the color of surroundings, but in any case illumination color is as significant as illumination intensity in planning modern plant lighting.

Economy of Good Lighting

Still, with all the advances in the manufacture and application of fluorescent equipment, the question industrialists will ask is: "Am I getting my full dollar's worth from the money I put into lighting?" The answer is, "Yes," if the right equipment is installed to do the task for which it is best suited. In fact, well-spent lighting dollars pay big bonuses to the wise plant operator.

Statistics show that only 2% of the manufacturing industry's capital dollar, or three mills out of their operating dollar, go into lighting; while surveys have shown that proper lighting will step up production 1% to 5%, cut down wastage from 5% to 20% and eliminate one out of six industrial accidents. This latter figure is highly significant when it is realized that industry now spends over $150,000,000 annually for accidents. Cut this down by one-sixth and at least $25,000,000 can be saved. This would buy acres of excellent fluorescent lighting.

In addition, the fluorescent lamp manufacturer is paying bonuses on the lighting dollar by increasing lamp efficiencies and reducing the cost of the lamps, so that the consumer is receiving as much as seven times more light for his fluorescent lamp dollar than *(To page 38)*

Distributing a high level of uniform illumination over the machinery in the drilling and tapping section of a new Bridgeport factory, simple industrial fluorescent lighting fixtures eliminate the need for portable lamps at machine level. The three-lamp fixtures shown here are used for work areas, while two-lamp units light aisles, corridors and warehousing areas. Conduits will be used to enclose wires visible in picture.

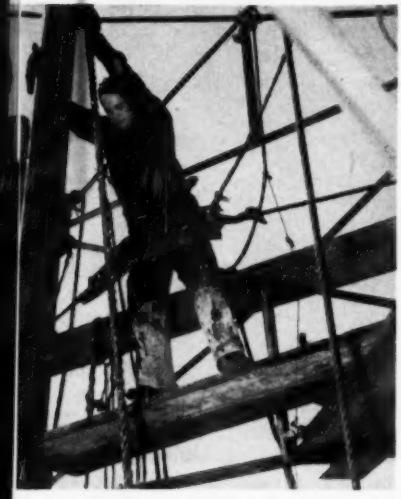
OIL ORGANIZES FOR

Over the past thirty years, the American Petroleum Institute has been instrumental in helping the oil industry to make progress in accident and fire prevention.

PART 2

(Continued from the October issue of SAFETY MAINTENANCE & PRODUCTION.)

IN PRODUCING operations, as in other phases of the oil industry, operating risks other than fire arise to plague safety records. To say that drilling, for example, is the most hazardous operation in the industry would be something less than the truth even though the drilling safety record is not as good as that of other operations. This stems partly from the relatively small size of drilling crews and partly from the fact that the accident frequency rate is computed on the same basis as that for the entire industry, namely, 1,000,000 hours exposure time.



The "breast line" provides support for the member of the oil-well drilling crew working aloft in the derrick handling the upper end of "strings" of drill pipe. In addition to "breast line" against which the workman leans, his safety is further assured by a heavy safety belt with rope attached to the derrick.

Of course, there are accident hazards peculiar to drilling. These include running into the crown, swinging tongs, fouled spinning chain, dirty rig floor, falling pipe, tools and sheaves and the ever-hazardous helper—the cathead. A recent analysis of accident causes in oil well drilling and oil producing in Texas, prepared by an insurance association, revealed that 54.3% of drilling accidents are caused by the injured man being *struck by objects*, or as a result of *handling objects*. In oil producing these two causes account for 61% of all accidents. Other drilling hazards include hand tools which account for 13.5% of the total accidents; falling persons, 10.7%; caught in, on, or between devices, 8.8% and temperature extremes, 4.5%.

In drilling operations, as well as throughout the entire petroleum industry, a continuous safety program is in effect which is designed to instill in the minds of workers the importance of personal protective equipment. Hard hats, of course, are considered a must item in and around most drilling operations. Wherever lengths of pipe or heavy tools are being handled daily, safety practices as well as common sense dictate the use of safety shoes, heavy gloves and any other necessary items of protective equipment. Metal masks and eye goggles are utilized in the welding of sections of pipe lines and in the construction of derricks.

Safety Training

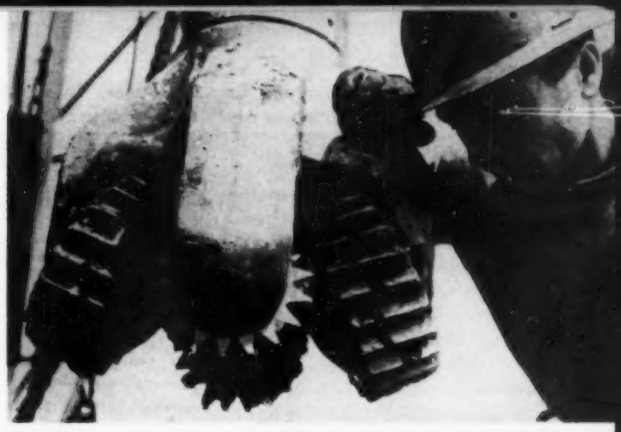
The most important job to be performed in improving the drilling safety record lies in our efforts to properly train and instruct personnel in the safe performance of their duties. The constant observance of practical safety rules and regulations in every detail of every job must become a vital and daily responsibility with every worker. In drilling, as in all phases of the industry, the safety program is only as efficient as the most careless worker, and constant vigilance becomes the price of safety.

Safety engineers in the industry are constantly being called upon to recognize and cope with new dangers, not only in the plants but in homes. When an airplane crashed in a refinery tank farm, fortunately in this particular instance without causing a fire, the members of the Committees on Accident Prevention were urged to take the matter up with local aviation representatives of the U. S. Department of Commerce, and insist that the hazard of flying over refineries and tank farms be called to the attention of all flyers.

On the home front it was even more serious. With little or no knowledge of the characteristics of gasoline, housewives were, never-

SAFETY

By FRANKLIN G. WILSON,
Director of the Department of Safety
American Petroleum Institute



The rock bit of a rotary drilling assembly is capable of penetrating hard rock structures in the search for oil-bearing formations. The grinding, crunching action of the bit tears away the rock and, sinks a hole to 10,000 feet or more deep. The hole is lined with steel casing through which oil and gas flow to the surface.

theless, quick to recognize the solvent qualities of the product and its use as an agent for home dry-cleaning operations became quite common. Too common, in fact, and a lot of unwarranted accidents and fires were the result. So information on the safe handling of petroleum products was prepared for the education of consumers.

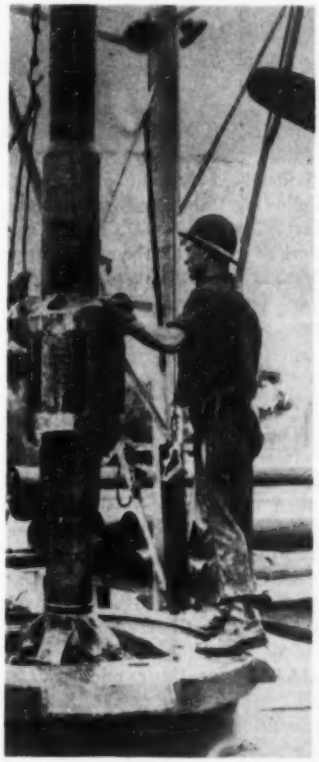
It will be remembered that 1932 was the year that all industries reached the nadir of economic experience. The petroleum industry was not exempt. Retrenchment was the order of the day. But in such times, serious consideration should be given before any curtailment is made in safety activity. Nevertheless there appears to have been talk of reducing the accident prevention activities of the Institute, and the Director of the Department of Accident Prevention was called upon to justify the continuation of the department.

In the justification it was pointed out that in five years the frequency of disabling injuries in the petroleum industry was reduced from 18 percent greater to 6½ percent less than the average for all other industries. This represented a net reduction of 54 percent in the accident frequency rate, and an estimated cash saving in compensation claims of more than $3,000,000. It was pointed out that:

Accident prevention is an operating problem and the accidents must be controlled by each individual company. It is recognized that each company is entitled to full credit for its good record, but without the interchange of information and the stimulation created by this interchange of thought and ideas made possible through the Department of Accident Prevention of the American Petroleum Institute, the industry would not have made greater progress than other industries. A leading safety engineer in the industry stated that he had reached a stalemate as to how to promote safety in his company until the program of developing safe and correct methods of doing work was inaugurated by the Institute, and that through its progressive procedure better results than ever before have been obtained.

The chairman of the Committee on Accident Prevention in marketing, in his report to the General Committee, November 15, 1932, remarked, "During times of deflation such as Industry is now going through, there may be a tendency to economize on accident prevention efforts by reduction of the safety engineering staff. The committee has noted no such tendency on the part of the petroleum industry. Accident prevention work has proven its economic value. To eliminate it is false economy. If it is discontinued by some companies, the work of the past few years will carry on of its own impetus for a period of six or seven months. Experience in the past has shown definitely that this is the longest period that can be expected for the operating executives to carry their interest without the assistance of an accident prevention department. After that, there will be an increase in accident rates and resultant cost increases."

Such an eloquent plea won the



The wall reamer, attached to the drill pipe above the bit, smoothes the side of the hole, placing it in condition for the casing pipe.

Board of Directors over and the accident prevention work was continued.

A decision of the U. S. Bureau of Mines, to curtail certain activities in 1933, deprived all industries of the services of government first aid instructors. To overcome this loss the Committees on Accident Prevention authorized appointment of a First Aid Committee instructed to establish first aid training standards for company instructors, and recognize examinations of company employees by them, so that workers trained in first aid would receive American Petroleum Institute First Aid Certificates. In taking this step, appreciation was expressed for past assistance received from the Bureau of Mines, and it was emphasized that this action by the petroleum industry was intended only to supplement, not to replace, the Bureau of Mines work. The following year it was reported that, as a result of this program, 95 official A.P.I. first aid examiner cards and 15,000 A.P.I. first aid certificates had been issued. It can be mentioned in passing that the first aid training rendered to employees in the industry has paid dividends, over and over again. Following the disaster at Texas City, Texas, in 1947, it was the work of trained petroleum industry first aid crews that kept the toll of dead from being greater than it was.

Motor Vehicle Safety

The progress of the petroleum industry in safety is, of course, matched by similar progress in other industries. Notable is the automotive industry. But as the number of vehicles on the road increased, so did the number of accidents, and the ulterior objectives of the *Accident Prevention Manual on Safe Driving of Automobiles*, which the Institute published in 1931, was to reduce the number of automobile accidents by educating the driver in the proper operation of his vehicle. The manual was, of course, slanted towards petroleum operations. In an effort to make the oil company motor vehicle accident prevention campaigns most effective and beneficial, a group of petroleum industry safety engineers met in Chicago to consider all of the aspects of the problem. The group agreed that the greatest obstacle would be in making the driver understand his driving problems and adapt his driving to road and traffic conditions. It was further agreed that the oil companies, through the American Petroleum Institute, should encourage a substantial progressive and permanent program which would endure, and set an example in motor vehicle accident prevention comparable to the example set by the industry in industrial accident prevention. A proposed program for intensifying public contact was outlined, and has carried over to the present day, not as an Institute function, necessarily, but in the individual companies. There is not an oil company in business today that does not foster motor vehicle safety among its own drivers as well as the motoring public.

That the program pays dividends is evidenced by 49,685 oil company vehicles which traveled a total of 815,956,880 miles during 1948, suffering less than two accidents per 100,000 miles traveled—an approximate average of 67,574 miles per vehicle without accident. The Institute defines a reportable motor-vehicle accident as "an accident in which a motor vehicle in company service is involved, unless properly parked, resulting in a death, personal injury, or property damage regardless of who was hurt, what property was damaged, or who was responsible."

Accident Prevention Committee

By 1937 the industry was well on its way out of the morass of depression, and a resolution was proposed aimed at enlargement of the Department of Accident Prevention of the Institute. The minutes of subsequent meetings do not indicate definitive action on the resolution, however. It will be noted that, unlike the fire protection committees, the committees on accident prevention combined most of their meetings and in the majority of cases any action taken was joint action, so the natural result was the permanent combination of the committees in 1939, into the Central Committee on Accident Prevention.

As a matter of broad public policy, both the existence of, and the activities of, the Central Committee on Accident Prevention bespeak the Institute's and the petroleum industry's interest in employee and public safety. The effectiveness of the committee's work in the prevention of personal injury and vehicle accidents, and of the related work of the Central Committee on Fire Protection, is attested by individuals, organizations and government officials having either real problems or misapprehensions concerning petroleum and public safety, turning more and more to the Institute for facts and sound recommendations.

Membership in the Central Committee on Accident Prevention provides the seventy participating safety engineers with knowledge to supplement their own broadened understanding of policy and offers added prestige, all of which bolsters their individual contacts through which the industry's voice is heard and its acts judged in each community and state.

Through the committee, close cooperative relationship is maintained between those responsible for safety in companies in all sections of the country. An exchange of experience and information on safety aids and techniques and the obtaining of a consensus of opinion on problems is secured. A forum for discussion is provided.

The more important activities include: providing a channel for exchange of information on accident prevention problems peculiar to the oil industry; gathering facts regarding petroleum safety and providing an authoritative agency by which they may be released to the press; securing the *(To page 48)*

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LEFT—
William E. Brown, plant engineer at the Phoenix Hosiery Company plant in Milwaukee, Wis., points out the high gloss on the floor in one of the company offices. The Phoenix plant was one of the seventeen places where the new slip-retardant floor finish was first tested. The product has won approval not only for its non-slip qualities but also for its durability and water resistance.

The employment office of the Phoenix Hosiery Company in Milwaukee is considered a "heavy traffic" area, and the application of the new finish resulted in the elimination of slip complaints and, according to William Brown, Plant Engineer, gave the floor a durable, glossy protective coating. The floor is asphalt tile which when covered with certain types of floor finishes can become dangerous.

Slow Down Those Slippery Floors

Chemists have developed a new kind of floor wax that offers a high-gloss finish, is easy to maintain, and at the same time provides a slip-retardant surface.

By JAMES R. BROOKS
S. C. Johnson & Son, Inc.
Racine, Wisconsin

IN CERTAIN floor areas under certain conditions, the slip problem has become increasingly apparent in the last four or five years. This is partly because of the more widespread use of certain types of floors and floor coverings. Safety engineers have found that on certain types of floor areas it has been necessary to forbid the use of ordinary waxes and alter normal maintenance procedures. In some cases floors have actually been inadequately maintained. Beauty, protection and cleanliness were necessarily sacrificed in the interests of safety.

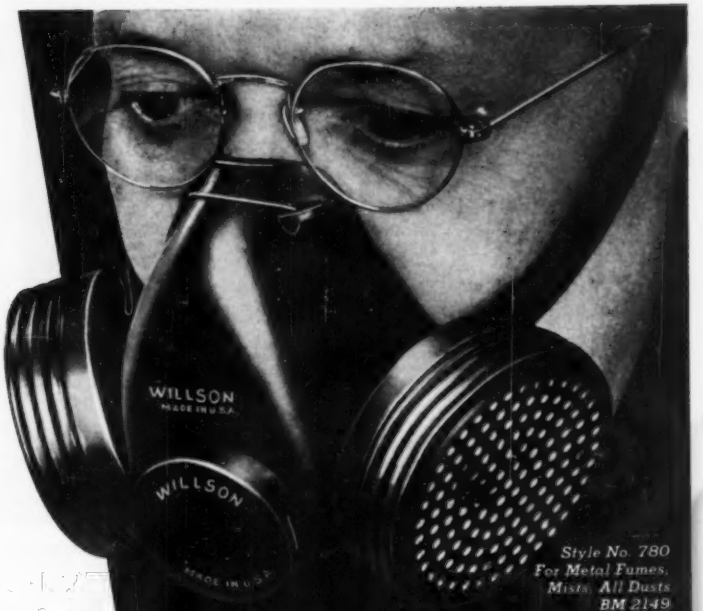
But the companies thus forced to alter their maintenance procedures were naturally not satisfied to have unsightly, dirty, dull looking floors. Among these was one of the important middle-west insurance firms. This firm went to one of the leading manufacturers of floor maintenance products in their search for a floor finish that would maintain their 100,000 square feet of asphalt flooring in top condition but would still not be slippery. This floor maintenance company supplied the insurance organization with a sample can of a new product just out of the chemists' laboratories, still in the early testing stages. Soon after this sample was tried on the insurance company's floors, a 55-gallon drum was ordered and later an additional drum.

Throughout the entire six-month period of the test, the insurance company purchasing agent and maintenance foreman had only praise for the new product. Besides being well pleased with the anti-slip properties of the finish, which is being distributed nationally starting November 1, the purchasing agent and the maintenance foreman were entirely satisfied with the ease of application, spreading ability, drying qualities, gloss and durability of the product.

The maintenance foreman was particularly impressed with the high gloss obtained on the floor after it was damp mopped and buffed.

Since this was but one of 17 different field tests of the product, it was only an indication that the

George Roth, Phoenix Hosiery Company employee, punches out at the time clock in a corridor of the Phoenix plant. The floor of this corridor takes particularly hard wear and in the past there were continual complaints about its slipperiness. Plant Engineer William Brown has found that since he began using the new slip-retardant floor finish on the asphalt tile floor, complaints about slipperiness have stopped.



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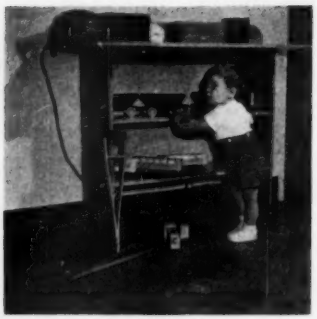

Physically handicapped children get special training at the Curative Workshop in Milwaukee, Wisconsin and many learn to walk through special aids and assistance supplied at the workshop. Because of the difficulty many of the children have in taking their first steps, every precaution must be taken to assure a safe, non-slippery floor. Building engineer Joseph Gebauer has found that a new slip-retardant floor finish, manufactured by one of the nation's leading wax makers, eliminates any slip problem and still keeps the floor clean and shiny.

laboratory's research and development workers had been able to formulate a special new product, especially designed to meet a particular need on certain types of flooring.

But the other tests, conducted under varying conditions in a variety of plants and offices in Minnesota, New York State and Wisconsin, proved equally successful.

Slip Resistance

The amazing slip-retardant properties of the new wax* were put to an extreme test at the Curative Workshop in Milwaukee.

It was imperative that the rubber tile floor in the children's nursery in this building provide safe footing since it was walked on by spastics and handicapped children. The building engineer was quite impressed with the way the new product "slowed down" the floor better than any other product ever tried, and he is now conducting tests in the amputee training room. He found the product met all the requirements of a self-polishing floor wax in addition to its slip-retardant characteristics. He said that, in general appearance, it has all the properties of a top quality floor wax—high shine, water resistant, and that it buffs well after frequent damp moppings.

Other extensive tests at such plants as *Eastman Kodak*, Rochester, New York, *Wisconsin Power and Light*, and the *Ray-O-Vac Company*, Madison, Wisconsin, brought similar results.

The Community Savings Bank in Rochester, N. Y., used it experimentally in its employee lunch room and in the vault. A month after a two-coat application, and with daily damp mopping maintenance, the bank gave unqualified approval to the product. It was stated that the product was superior to any other floor finish ever used and that should it become available, it would be used for the regular maintenance of all asphalt tile areas in the bank.

The new product is recognized by *Underwriters Laboratories* as "a non-slip floor finish." In recent UL tests, it showed friction coefficients equally high on rubber, asphalt tile, and linoleum floors.

According to the director of the research and development division which conceived and perfected the new product, it is a real slip-retardant floor finish that still has the properties of high quality self-polishing wax finishes.

"There have been many anti-slip claims made for ordinary waxes," he says, "but none of them have fully met the requirements."

Pictures by courtesy of S. C. Johnson & Son, Inc.

* The trade name of this product and the address of the manufacturer may be obtained on inquiry to the editor.

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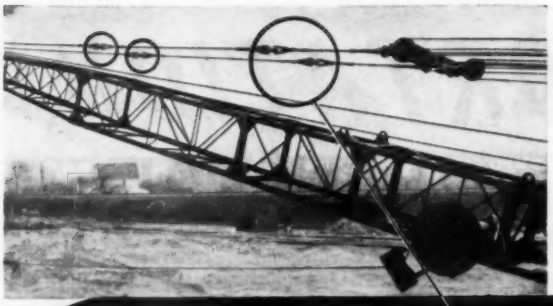
Safer Book Matches Are Introduced

MOST of the smokers of this country have at some time or other been lax about closing the cover of book matches before lighting the match. Although this casual disregard for the warning printed on the match folder is practiced only occasionally by many people, it is even habitual with others. No matter what the frequency of these lapses may be, they always offer the spluttering match head the opportunity of igniting the whole folder. Almost everyone has experienced this type of accident or has seen it happen to others. Although most people escape with injuries no more serious than surprised embarrassment, there have been many occasions when people have received serious burns.

Since human nature persists in not learning by experience, especially in what are seemingly small matters, one forward-looking company has tried to do something about the situation. The Arcade Sunshine Laundry Company of Washington, D.C. has had book matches made up with the striking surface on the reverse side of the folder. The new type of matches are distributed through vending machines and other mediums by the G. B. Macke Corporation. By forcing the user to turn the match folder over, there is less chance for the unused matches to become ignited.



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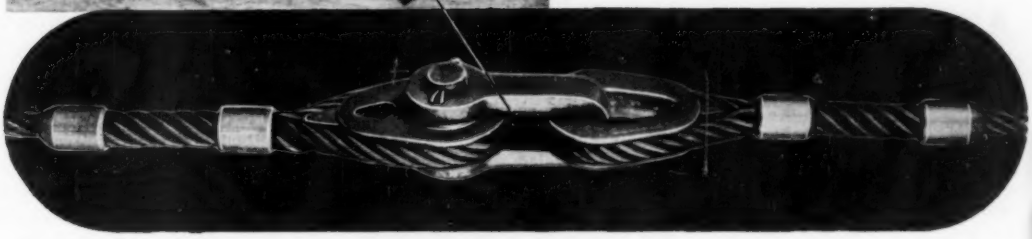

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RAILROAD SAFETY AWARDS

AMERICAN railroads in 1949 continued to improve their outstanding safety record, according to an address prepared by Wallace J. Falvey, President of the American Museum of Safety, at the organization's annual Harriman Award Dinner held in the Hotel Ambassador, New York, on September 20th.

Col. Robert S. Henry, Vice-President, Association of American Railroads, also spoke at the dinner on the subject, "The American Way —The Safe Way."

Many prominent railroad officers and industrial leaders attended the affair at which the thirty-first annual award of the E. H. Harriman Gold Medals was made for the best safety records last year among the railroads of the country.

In the absence of Mr. Falvey, because of sudden illness, his address was read by Col. Alvin B. Barber, formerly Chairman, Transportation Committee, U. S. Chamber of Commerce.

"Fewer persons lost their lives in railroad accidents in 1949 than in any of the 62 years during which the Interstate Commerce Commission has kept records," according to Mr. Falvey's address. "The number of fatalities to all classes of persons in railroad accidents of all kinds was 28 per cent less than 10 years ago, 40 per cent less than 20 years ago, and 56 per cent less than the total fatalities recorded 50 years ago."

Mr. Falvey pointed out that this outstanding record of progress in railroad safety does not take into account the greater volume of total traffic handled in 1949 as compared with the other periods mentioned, nor does it allow for the increased hazard at highway grade crossings due to the vastly increased usage of private and commercial motor vehicles. Last year 46 per cent of all fatalities in railroad accidents, Mr. Falvey added, were persons involved in grade-crossing accidents, and another 37 per cent were persons trespassing on railroad property.

Records available for the first four months of the current year indicate a slight over-all improvement when compared with the corresponding period of 1949, Mr. Falvey disclosed.

How Was It Done?

In his address, Col. Henry also lauded the great safety achievements of the nation's railroads, which he called one of the outstanding accomplishments of an industry with a great record of progress and achievement.

"There are inherent risks," Col. Henry said, "in sending a train of a thousand, or five thousand, tons hurtling down a track at high speed. And not just one, but 30,000 such trains are run every day for a total distance of nearly 3,000,000 train-miles. They carry, every day, more than 1,500,000 passengers. They move, every day a ton of freight more than 10 miles for every man, woman and child in the United States. Their chances for accident are almost infinite; their record of accidents, in relation to the chances, is infinitesimal!

"Partly, this record is due to engineering in the development of safe plant, equipment and devices. Partly, it is due to education in safe rules and safe practices. Partly, it is due to the sort of safety evangelism which avoids taking unnecessary risks but which is ready to meet emergency when it comes."

Col. Henry also pointed out that the $17 billion spent in the last 30 years by American railroads to improve their plant and equipment has also in one way or another contributed to safer operation. He also said that the effort for safety can never be relaxed if the great gains already made are to be held, and added that the great record made in railroad safety "encourages the belief that by like methods, like gains may be made in another sort of safety movement—the movement for the safety of America through conserving the fundamentals of our American system of free enterprise and free government.

"For nearly 40 years, now," Col. Henry said, "such men as you who are here tonight, and your predecessors, have carried on a campaign to make all our people a safe people. More than 30 years ago, the late Mrs. Mary W. Harriman provided for annual awards by the American Museum of Safety to stimulate the effort for the conservation of human life on the railroads. The awards were instituted in memory of the late E. H. Harriman, and in recognition of the interest which he took in such movements on the railroads which he directed. The awards continued by the sons of Mr. and Mrs. Harriman, are once more being granted tonight to leaders in the safety movement among railroads of the several classes."

The Citations

Three railroads which led their respective classes in safety records

SAFETY

in 1949 received gold medals at the dinner. In addition, Certificates of Commendation for outstanding performance in railroad safety were presented to nine other railroads—three each in the Eastern, Western and Southern Districts—and for the first time to two switching and terminal companies.

For the best safety record last year among the larger railroads of the country, the gold medal went to the Norfolk and Western Railway Company. R. H. Smith, President, accepted the award, which was presented by James G. Lyne, Editor, The Railway Age, and Chairman of the Award Committee of the American Museum of Safety.

The gold medal for the best safety record among the Class B railroads went to the Western Maryland Railway Company, whose President, Eugene S. Williams, accepted it.

The gold medal for the best safety record among the Class C railroads was awarded to the Colorado & Wyoming Railway Company. The award was accepted by Ward Wire, Vice President.

Personal Award

Another personal safety award—the Arthur Williams Memorial Medal—was given at the dinner to A. V. Rohweder, Superintendent of Safety and Welfare, Duluth, Missabe and Iron Range Railway Company. The presentation was made by Julian H. Harvey, Chairman, the Arthur Williams Award Committee.

The awards were determined on the basis of official records of the Interstate Commerce Commission for the year 1949, the railroads being ranked in their several groups according to their individual safety ratings.

Traffic Engineering Handbook

A REVISED and expanded edition of the "Traffic Engineering Handbook," the only comprehensive source book of techniques, principles and standards relating to street and highway traffic control and design, has been jointly published by the Institute of Traffic Engineers and the Association of Casualty and Surety Companies. This official handbook of the Institute of Traffic Engineers provides the latest facts, figures and formulae needed by traffic and highway engineers, transportation and planning officials, educators, students, researchers, economists and police. It is designed to serve as a practical day-by-day guide to the practicing traffic engineers and others who are called upon to solve traffic problems.

The handbook has been prepared under the direction of the traffic engineers handbook editorial board. Contributing authors include 16 of the nation's leading traffic and transportation engineers, while 35 specialists and authorities in the traffic field reviewed the text. Featuring 205 tables, 215 illustrations, 489 definitions of traffic terms, and 520 pages, the handbook covers such varied subjects as traffic accidents, traffic studies, roadway capacity and design, traffic signals, speed regulations and zoning, traffic signs, and street and highway lighting.

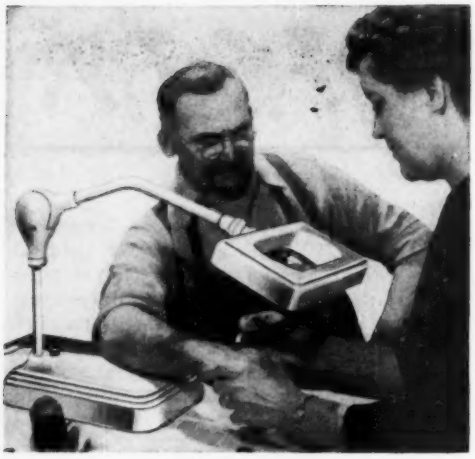
In addition, other chapters deal with vehicle and highway facts, vehicle motion, the driver and pedestrian, traffic markings and markers, parking and loading, one-way streets and arterial routes, traffic islands and pedestrian barriers, and pedestrian islands and bus loading zones. The handbook is priced at $6 per copy; 26 copies and over, $5 per copy. Copies may be secured by writing to the Accident Prevention Department, Association of Casualty and Surety Companies, 60 John Street, New York 7, N. Y.

Oil Trucks To Lose Drag Chains

THE National Fire Protection Association has officially removed any reference to drag chains from the organization's fire codes. The association stated: "The committee on flammable liquids now does not recommend drag chains, but specifies more positive bonding and grounding arrangements, having found that drag chains are not sufficiently reliable for the intended purposes, particularly where vehicles operate over bituminous macadam roads, very dry concrete, etc. . . ."

The purpose of the drag chain was to ground the static charges, but the American Petroleum Institute had the California Institute of Technology find out how effective this method really was. During two years of research, the electronic ammeter built specially for the tests failed to show any practical value for drag chains when the pavement was dry. The best protection against ignition of oil by static sparks during loading or unloading operations was found to be a metallic bond between the oil truck and the discharge or fill pipes. These "bonding cables" have been used for many years on tank trucks carrying volatile liquids.

Three out of four traffic accidents happen in clear weather on dry roads.



Give the worker a break. First aid installations will profit the medium and small plant as well as compensation carriers.

WITHOUT OR WITH FIRST AID?

SAM BOLAN is just an average worker in a small plant. He snagged his finger on the wheel of a grinder. It was just a small injury. He couldn't be bothered taking an hour or so off to see the company doctor. Instead of having the scratch properly cared for, he let Joe, his pal at the next grinder, bandage the wounded finger with Sam's not-too-clean handkerchief.

Several days later the injured spot appeared to be in bad condition. Sam was unable to continue his work and suffered tormenting pain.

Sam probably will not be able to go back to work for 30 days. It is true that he saved the boss several hours of work time and the compensation carrier $3.00 or $4.00 in the doctor's bill. Yet, the neglected infection will cost the insurance people many times the cost of the doctor's fees.

Experiences such as the above have led to the establishment of first aid stations in thousands of plants throughout the nation. The cost of the equipment is surprisingly small. On the recommendation of his insurer, the manager of the shop where Sam and Joe worked installed a complete First Aid equipment at less than $30.00 cost.

A small corner near the wash room was set aside. It was equipped with a table, two chairs and a good light. Dressed up with a coat of paint, using the color recommended in the instruction sheet in the kit, the station looked neat and attractive. What is more important, it was efficient.

Miss Wilson, the bookkeeper, was placed in charge. She attended a series of Red Cross Lectures for training in her new duties. A few weeks later, there was another hand injury, similar to Sam's. As shown in the picture, Miss Wilson was able, by means of the new equipment and her new training, to give the injury the right kind of attention. No one doubts her ability to give service on MINOR injuries.

What injuries are MINOR?

1. Where the illuminating lens shows a piece of grit resting on the corner of the eyeball before it is rubbed in. The grit is easily removed by a flake of cotton. Otherwise, Miss Wilson would bandage the eye to prevent rubbing and have the victim taken to the doctor. This is a good example of one type of minor injury.

2. There are other kinds of minor injuries: cuts, scratches, burns, bruises, scalds. Statistics show that over 60% of ordinary or usual shop injuries are MINOR.

The chief cause of infection of injuries, large or small, is lack of proper treatment. It has been estimated that the average infection costs $39.94. The average cost of a first aid case (no infection) is $2.44.

The investment referred to above consists of a magnifying unit which enables the attendant to be acquainted quickly and accurately with conditions. The same lens and illumination may be had with a cheaper fastening.

Only the best and most efficient materials should be in the First Aid Kit. An ideal preparation is one that is a mild germ arresting type of antiseptic having a minimum of evaporation.

It is obvious that if the services of Miss Wilson had been available when Sam had that slight injury, the loss would have been avoided at the cost of possibly five minutes of her time and about eight cents worth of materials.

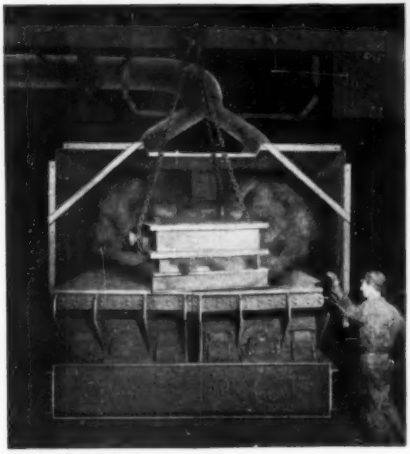
Pictures by courtesy of the Surty Mfg. Co. Inc.

Improve working conditions

Lower costs

Increase production

In dry grinding



For foundry shake-out

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Engineered dust control contributes to better and safer working conditions, increased production, and lower direct and hidden costs. Wherever air contaminants create a problem, *you* can utilize Sturtevant's background of engineering knowledge.

This experience covers a wide variety of applications. Sturtevant-engineered systems, now in operation across the country, control dusts which are injurious to workers' health and comfort, create fire or explosion hazards, increase maintenance costs, or make "housekeeping" difficult. Sturtevant engineers will cooperate with you in designing an exhausting system that meets your individual needs.

To get complete information on your problem, contact your local Sturtevant office, or write to Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Massachusetts.

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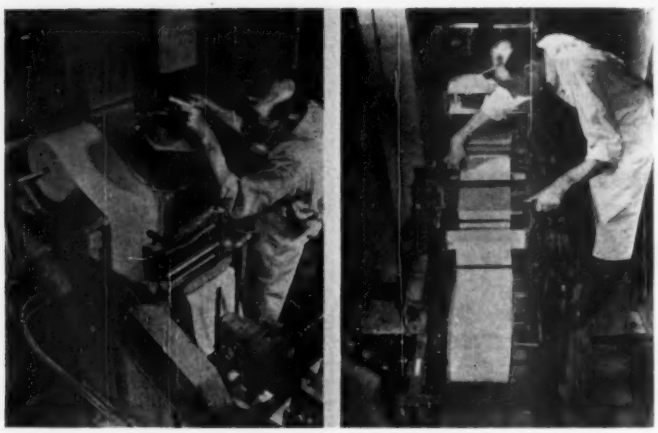
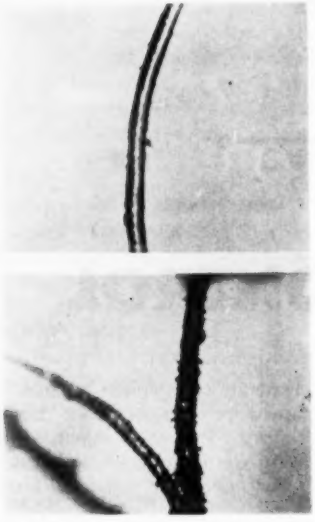


Shown above are steps in the special chemical and mechanical treatment of dust filters.

WHAT MAKES DUST-CATCHERS CATCH?



High efficiency of the dust filter mentioned in the article is caused by a special chemical and mechanical treatment. Lower photomicrograph shows clearly the resin-coated fibers of the treated filter as contrasted with an untreated filter shown in the upper picture.

THE story behind the development of a super-efficient filter material currently protecting industrial workers exposed to toxic, pneumoconiosis-producing and nuisance dusts is revealed in a recent patent.

The filter material, adapted for use by American Optical Company

STORY BEHIND RESPIRATOR DEVE' OPMENT DISCLOSED

in several of its respirators, consists of a wool felt that has been chemically and mechanically treated. This treatment has hitherto been a closely guarded trade secret.

The patent discloses that the felt is first impregnated with a resin in an organic solvent after which it is irradiated by infrared. The chemically treated felt is further activated by mechanically fracturing the resin film which coats the fibers in the felt.

Interestingly, it was discovered that both the impregnating and mechanical breaking steps are essential in the manufacturing process, because impregnation alone, without the mechanical treatment, produced results no better than unimpregnated felt.

Careful laboratory tests of the treated felt showed an increase in protection effectiveness ranging from two thousand to four thousand per cent for various types of dusts, as compared with similar untreated felt.

American Optical scientists theorize that the effectiveness of the filter stems from the chemical and mechanical treatment which apparently induces electrostatic charges in the wool fibers and their attached resin fragments. These charges, the AO scientists believe, attract charged dust particles entering the filter with the contaminated air, thus trapping the dangerous dust particles.

Development of the filter, which excludes poisonous and disease-producing dusts smaller in diameter than 24 millionths of an inch, made it possible for American Optical scientists to design Bureau of Mines approved respirators with considerably smaller filter areas in comparison with previous respiratory

Typical respirator with cartridges containing treated dust filter and specially activated sorption material. It protects against dusts and low organic-vapor concentrations.

devices. This has resulted in lighter weight respirators with increased field of vision for wearers.

The filter has been adapted for use in the optical company's R2000 single cartridge and R5050 twin cartridge dust respirators; also the recently announced R5055 respirator which provides protection against dusts or low concentrations of organic vapors, or a combination of both.

The latter respirator, with its twin cartridges containing the treated filter and specially activated sorption material, has been tested and found satisfactory by the U.S. Department of Agriculture for respiratory protection against low dust concentrations of the new and highly toxic insecticide, Parathion.

Pictures by courtesy of the American Optical Co.

Safety Director Appointed

THE firm of Kaschel, Kes and Spies, Insurance Brokers, Managers and Advisors, announce the appointment of Forrest K. Van Horn as Safety Director. Associated with the field of automobile and industrial accident prevention for over 20 years, Mr. Van Horn is familiar with administration of Safety programs from the insurance, industrial and brokerage viewpoints. His experience embraces a wide field of industry.

The change has been made as part of a planned effort to acquaint industry with the value of efficient insurance management in all its phases. Mr. Van Horn resigned from Herbert L. Jamison & Co. to accept his new responsibility.

Silvey Heads Wash-Rite

ANNOUNCEMENT has been made by the Wash-Rite Company of Indianapolis of a general expansion of its industrial laundry and repair facilities and the election of Mr. J. E. Silvey to the office of president and general manager.

sleep's unaffected...

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Worry! Fret! Loss of sleep thinking about fire cutting into production time ... destroying valuable records ... costing lives of employees ... all are anxieties of the past when your factory's protected with modern, approved C-O-TWO Fire Protection Equipment.

For example, the new C-O-TWO Low Pressure Carbon Dioxide Type Fire Extinguishing Systems keynote flexibility to meet your particular fire protection needs. Flammable liquids, electrical equipment, storage and manufacturing processes can all be made firesafe from a single low pressure carbon dioxide storage tank ... capacities range from one to fifty tons of fire killing carbon dioxide. If fire should strike the fast-acting, non-damaging, nonconducting carbon dioxide extinguishes the blaze in seconds ... no water damage, no lingering odors.

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So, whatever your fire protection problem, let an expert C-O-TWO Fire Protection Engineer help you in planning complete and up-to-date fire protection facilities now. Write us today ... tell us about your particular fire hazards, our experience is at your disposal ... no obligation of course.

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Giving your men the finest in eye protection doesn't mean you have to pay premium prices. Get Eyegard goggles and save the difference! They're the goggles that provide greater comfort because the lightweight plastic frame is molded to form-fit the face . . . greater protection because the goggles are impact-resisting . . . greater ventilation through three large vents at side of cup and seven additional vents around the lenses. Cool and fog-free. With all their exclusive features, they cost no more than ordinary goggles. Get Eyegard "Champions" on next order.

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AMERICAN INDUSTRIAL SAFETY EQUIPMENT COMPANY

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DIVISION OF THE BURDETT OXYGEN COMPANY - CLEVELAND, OHIO

Planned Lighting

(From page 23) he did a few years ago.

Long-life fluorescent lamps were introduced over two years ago. These lamps operate for 7,500 hours, or three times longer than previous fluorescent lamps and ten times longer than standard 60-watt incandescent lamps.

More important than the long life of these lamps, however, is the fact that they remain bright and clean, with very little discoloration, up to 5,000 burning hours. Formerly, discoloration and a drop in efficiency could be expected with 1,750 hours of burning.

This longer life represents a gain of over 200% in lighting value per lamp dollar and is particularly important in factories where hundreds, and frequently thousands, of lamps are used. This extra life means purchasing economics and lower maintenance costs for relamping, as well as more uniform lighting which makes for better seeing conditions.

How Much Light?

The quantity of light needed depends on the task to be performed, and the level of illumination at any point may be easily found by placing a foot-candle meter at that spot and reading the value indicated by the pointer on the scale. Tables of recommended foot-candle levels for various industries have been compiled and are included in the booklet, "American Recommended Practice of Industrial Lighting," published by the Illuminating Engineering Society.

Under general illumination of an adequate intensity, it is possible for the worker to see quickly objects that are hidden in the semi-darkness of poor lighting. A definite hazard, such as a round bar lying on the floor, may not be noticed by the workman walking through the room when the illumination level is low, and a dangerous fall may result. However, sufficient light will attract his attention to the bar in time to prevent his stepping on it.

Glare is often described as "light out of place." Since it greatly impairs vision and produces a feeling of nervousness, discomfort and fatigue, it is one of the most serious defects in a lighting system and a common cause of industrial accidents. It should be eliminated by shielding light sources within the field of vision and arranging fixtures properly.

Direct glare is usually caused by light coming directly to the eye from an unshaded light bulb or fluorescent lamp. Reflected glare results when images of the light sources are reflected into the eyes from polished metal parts or glossy surfaces and can be as annoying as direct glare. Since these polished parts are often a necessary section of the work, reflected glare must be reduced by proper diffusion and direction of the light.

There will be no harsh shadows to hide potentially dangerous moving parts, and reflected glare will be minimized when the illumination is properly diffused. As a general rule, diffusion of light is no problem when fluorescent lamps are used since they are large area light sources of comparatively low brightness and produce only very soft shadows.

Light Distribution

Distribution of light is an important factor in accident prevention since improper distribution causes much eye fatigue, and this eye fatigue may lead to accidents.

SAFETY ENGINEER SUPERVISOR

Safety Engineer Supervisor available. Ten years' experience in construction, plant and traffic safety. Extensive experience in various types workmen's compensation investigation and reporting. Radiological Safety experience. 2½ years La Salle Law. Excellent efficiency ratings and references. Available January 2, 1951.

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SAFETY MAINTENANCE & PRODUCTION

75 Fulton St., New York 7, N. Y.

An insufficient number of lighting fixtures for general illumination and the resulting wide spacing cause an uneven distribution of bright spots and dim spots. The work area may be sufficiently well-lighted for the seeing task, but the comparative darkness of the surrounding areas introduces a seeing hazard. When the worker moves from the relatively high level of illumination of his work to the dark surrounding areas to which his eyes are not adapted, he is unable to see dangerous conditions for many minutes, in some cases. It must be remembered that it takes 60 times as long for the eyes to adapt themselves to a lower level of illumination than to a correspondingly higher level. If local lighting alone, with no general illumination is employed, the condition is even worse, and the eyes of the workman are subjected to a tiring shock every time he looks up. Since workers raise their eyes from their work hundreds of times every day, the danger of local lighting without evenly distributed general lighting is especially serious. Properly-spaced lighting fixtures for general illumination are required to assure a uniform level of intensity over the working areas.

Simplified Maintenance

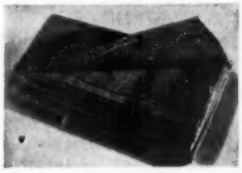
No little part of decreased cost and higher efficiency of fluorescent lighting systems is due to sensible maintenance plans now followed by careful industrialists. An ideal arrangement is employed in one plant, where a high-bay main assembly area has a system of catwalks provided specifically for maintenance purposes. The maintenance worker on the catwalk can readily remove the lamp or starter, replace where necessary and proceed to clean the reflector. Reflectors also are easily removed so that ballast and fixture parts are serviced with a minimum of effort. In sub-assembly areas of the plant, a mobile platform to lift maintenance men as high as 45 feet is used to keep other sections of the system

GARDWELL Products

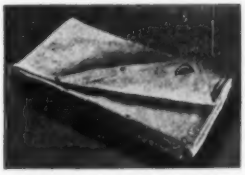
SAFETY PROTECTION THAT COUNTS!

Greater Safety means less lost time due to accidents and consequently more man power. With the increasing shortage of skilled workers that is important. You can enjoy greater safety in your plant by using GARDWELL Safety Clothing and Equipment in all departments.
This is our Twenty-Fifth Year of designing and manufacturing safety products for all work hazards. A few GARDWELL items are shown here. Our catalog describes the complete line.

GARDWELL FIRE BLANKET CONTAINER
Painted red with white lettering this metal blanket container is instantly spotted when needed. Holds either wool or asbestos blanket. Equipped with quick bottom release.



GARDWELL BLANKETS
Both wool and asbestos blankets are available. Asbestos blankets are made from Underwriters Grade Asbestos.



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Both asbestos and fireproofed duck curtains are available. Made with eyelets or wide seam at top.

GARDWELL EDMONT NEOPRENE COATED GLOVES
Have sturdy fabric lining,—are dip coated with Neoprene—Heavyweight. All sizes. Black only.

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Stamped from tough aluminum alloy with ribs for added strength. Light weight—Fully adjustable for all head sizes—men or women—Fully suspended head band affords maximum shock absorption.

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DUST
HERE'S A SAFETY IN NUMBERS!

5 SIZES OF HOFFCO-VAC Portable VACUUM CLEANERS and

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For your campaign against dust that is hazardous to health or damages production, Hoffman offers a broad selection of vacuum cleaning equipment with a type and size exactly right for your cleaning problem. Heavy-duty portables in 1½, 3, 5 and 7½ horsepower models, plus a 5 H.P. model powered by gasoline engine. For these, or the wide range of stationary systems, your Hoffman representative can furnish exact recommendations.

NEW! 1½ H.P. HOFFCO-VAC operates 35-ft. Length of Hose

Industry's first BIG little vacuum cleaner! Built for heavy-duty, continuous service. *Big* in dust storage capacity, suction and dust separation, yet compact, portable and easy to operate.

WRITE FOR BULLETINS!

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Multistage Centrifugal Blowers and Exhausters

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AIR APPLIANCE DIVISION
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CANADIAN PLANT: NEWMARKET, ONT.

in efficient working order.

Other plants employ the services of an outside fluorescent maintenance organization, a recent addition to servicing trades, which specializes in keeping fluorescent lighting systems at peak efficiency.

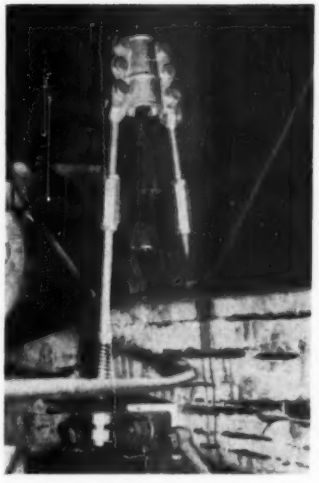
Where there is a need for outside service there are two basic plans being used. The first is a partial maintenance plan, wherein a contractor remains on call to replace lamps, starters and ballasts and to keep the fixtures in good electrical operating condition. The second plan offers a more complete service, with the contractor maintaining the fluorescent lighting system by regular periodic visits. He cleans the fixtures and replaces parts where necessary.

Planned fluorescent lighting maintenance, next to good equipment, is the focal point of excellent fluorescent lighting. It gives the user the maximum amount of useful light at the lowest cost and, consequently, brings the highest return to everybody concerned—management and the men who work at the machines. These are the groups which must be satisfied and fluorescent has satisfied them. For this reason it can be said that fluorescent lighting, which proved itself during the toughest years of America's manufacturing history, is actually the primary plant lighting system today.

Pictures by courtesy of Sylvania Electric Products, Inc.

SAFETY MAINTENANCE & PRODUCTION Salutes a Safety Idea for November

Safety Device Prevents Elevator Crash



A NEWLY marketed safety device saved from serious injury and even death an elevator operator at the Holyoke Card and Paper Co. of Holyoke, Mass. Both injury and property damage were prevented by the entirely automatic action of the elevator safety clamp which gripped a severed cable and held the elevator.

The operator was transporting heavy rolls of paper up the four-story shaft and had already made several trips. When entering the elevator after a stop at the ground floor, the operator glanced up and noticed that the severed cable end was dangling over the housing from which it had pulled loose. (See picture.) Invented by A. J. Lucas, an elevator inspector, the safety clamp, by gripping the broken cable, was holding the elevator.

It is said to be difficult, if not impossible, to inspect the housing in which the elevator cable is fastened. The first time that trouble is discovered in these socket and bolt connections is when it is too late. The cable has already come out. However, the Lucas type of safety clamp, which is available commercially, can overcome this inspection-maintenance problem by offering security against socket failures.

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This special liquid, made possible by a newly discovered physico-chemical principle, stops fogging and steaming of eyewear.
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FOG-FREE pays for itself in increased worker efficiency. Non-Hazardous — Easily Applied — Lasting Effect.

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Lint-Free Lens Tissues
Dispenser Cabinets

Make your own test now — order a sample bottle of FOG-FREE complete with spray pump, $2.00 postpaid.

Fire Training School

A RECORD class of 46 fire students—more than twice the size of any previous class—has recently been graduated from the Ansul Chemical Company's customer fire training school in Marinette, Wis. The school lasted three days and consisted of instruction in how to fight various types of fires, including small gas fires, sodium fires, and pressurized petroleum fires.

Many of the students were taught to fight fires peculiar to the industries they represented. Among those participating were six members of the Canadian Air Force; representatives of the U. S. Steel Corp., Central Illinois Electric & Gas Corp., Socony-Vacuum Oil Co.; Johns-Manville, of Waukegan, Ill.; American Steel & Wire Co.; General Electric, International Harvester, Chicago, Milwaukee, St. Paul & Pacific Railroad, Republic Steel; Carnegie-Illinois Steel Corp., National Distillers Chemical Corp., Indianapolis Municipal Airport, Studebaker Corp., Public Service Co. of Northern Illinois, Peoples Gas, Light & Coke Co., United Fuel Gas Co., Hope Natural Gas Co., Williams & Co. Ltd., Imperial Oil, Ltd., Texas Eastern Transmission Corp., and Fire Chief Leonard Keller, of Norton Airbase, San Bernardino, Calif. The representatives of the National Distillers Chemical Corp., received special training in fighting sodium fires.

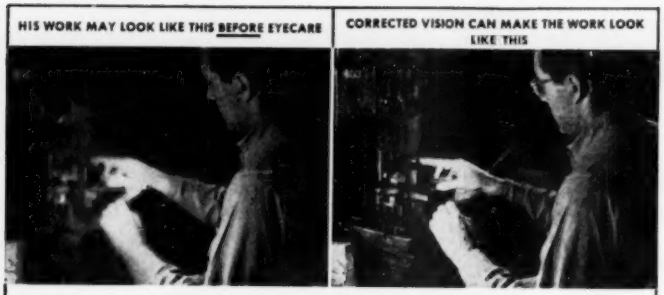
Emergency Lighting

(Continued from page 17) failures occur somewhere almost daily under *normal* conditions. There is certainly no sense in not preparing for them now when almost any day, conditions may become *abnormal*. It is rather surprising to find so many industrial plants, hospitals, department and chain stores, banks, etc. with the most modern, costly lighting installations and no provision against a sudden, unexpected light failure.

Uses of Emergency Lighting

To enumerate all the uses of emergency lighting would be beyond the scope of this article. The following is a list of some indispensable uses:

1. To illuminate exits, stairways, elevators in order to expedite a safe evacuation of crowded premises.
2. To locate fire alarms, fire fighting equipment, safety valves, switches and other safety controls.
3. To avoid damage to fixtures and machinery.
4. To avoid contact with moving machinery.
5. To make emergency repairs.
6. To spot dangerous or flammable materials.
7. To illuminate cashiers' cages and valuables to avoid theft.
8. To avoid sabotage.
9. To avoid panic, personal in-



How to get Better Production

without adding a man or a machine!

Best estimates indicate one out of three workers needs eyecare and that 40% to 60% of goggle wearers need *corrective* as well as *protective* lenses. One manufacturer reports that 9 out of 10 workers increase production when vision is corrected—with spoilage decreased 37%. Read how better worker vision pays dividends too in fewer accidents, less absenteeism, better morale — write for AO's booklet which shows how much can be saved by a visual correction program — and how it can be done. Address Dept. CP-S11

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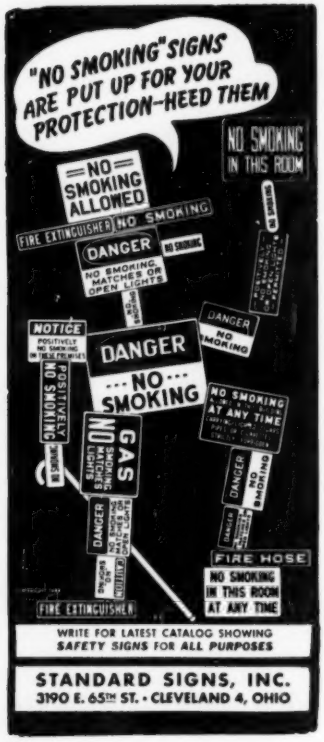

jury and possible fatality.

It is surprising to know what some people consider adequate emergency lighting protection. I know of one instance where a large retail chain organization furnishes its help with ordinary flashlights. A responsible executive of a prominent department store recently asked me, in all seriousness, to quote him prices on manually operated hand lanterns, these to be placed throughout the store so that the sales people could operate them in the event of a power failure. My reply was in the form of one question, "How will the sales people find the lanterns in the dark?" The order to equip this store with automatic equipment was placed two weeks later.

Since it is the first minute or so which is most crucial in preventing panic in the event of a power failure, it is obvious that there just isn't sufficient time to fumble in the dark for flashlights and lanterns. (And believe it or not, for candles and kerosene lamps!) Such a system, if you can call it that, offers little or no protection. In an atomic age, it is a grotesque anachronism.

There is only one sort of emergency lighting that can seriously be considered—the kind that operates *instantly* and *automatically* when a light failure occurs. There must be *no* delay, *no* need for personal manipulation.

Units Available

There are on the market three types of automatic emergency lighting for your consideration. They are:

1. Generator systems, usually gasoline operated, are available in any capacity to meet your requirements. Manufacturers of this type of equipment have experienced electrical engineers who can be consulted to recommend the proper installation.

2. Portable, plug-in, wet-battery-operated units. These are plugged into the regular lighting circuit and require no special wiring. At the instant of current failure, a relay connects the emergency lighting circuit and the light goes on. These units usually are equipped with a built-in charger which operate off the 110 volt circuit and which keeps the battery in a fully charged condition. Some units in addition contain a fast charger that will restore the capacity of the battery which has run down because of a prolonged power failure. There will also be available a unit with a charger which automatically adjusts the rate of charge into the battery. They can mount extra adjustable lamp heads, some units supporting as many as five lamp heads. The candle power of the lamps and the emergency burning period are determined by the voltage and amperage of the battery. Most of these units are equipped with six volt batteries. Although these units are portable, it is the common practice to give them a permanent mounting on a bracket or shelf, placed in strategic areas and with

lamp heads pointed in the desired direction. There are now available several types of emergency exit lights. These are wired or plugged into the existing electrical system and function like any ordinary exit light. If, however, the regular source of power should fail, the exit light is then illuminated instantly and automatically from self contained batteries within the unit. The emergency operation also furnishes a downward beam of light to illuminate the floor area. Emergency exit units are dry battery operated.

3. Portable plug-in units operated by dry battery. The manner of operation, by relay, is the same as above, but these units have no charger.

Many industrial and commercial organizations consider types two and three listed above more practical because of the low cost and the fact they require no special wiring. But even among these units, there is considerable variation. Several factors should be carefully considered before you make your choice. Look for:

1. Instant automatic operation.
2. Sufficient battery capacity for your requirements.
3. Sufficient candle power or light output.
4. Sufficient capacity for additional lamp heads if necessary without putting too great a drain on the battery.
5. Hours of emergency service the unit can supply.

As these questions are more or less technical, it is important to buy from a manufacturer who has an established reputation and who is in a position to advise you, to help you lay out a system that will fill your particular needs.

How much emergency lighting do you need? The answer to that question is necessarily varied. If, for example, you operate a department store, the first consideration will be the safe evacuation of the store and then the avoidance of theft and damage to property. In a hospital, the prime considerations are to avoid panic, to provide lighting in operating rooms, to gain access to medical supplies, oxygen tanks, etc. In an industrial plant, in addition to the safe evacuation of employees, it is important to locate fire alarms, fire fighting equipment, control valves, switches, etc. Don't hesitate to call upon the emergency lighting specialist. He will point out the danger spots and come up with the answer to your particular problem. There is no one solution for everybody. Your problem and therefore, your requirements will differ from every one else's. Let the specialist give you the benefit of his training and experience.

The three types of units mentioned are available through a number of responsible manufacturers. All will give dependable emergency lighting protection. You many find one type that will amply cover your requirements or perhaps a combination of various types. The answer to your problem

(To bottom next page)

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BUILT FOR Comfort
Smart streamlined style built into KNAPP Aerotred Saf-Test Shoes!
STYLE K-51
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Oil-Resisting
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IN STOCK
SIZES (A7–14) (B6–14)
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Knapp
SAF-TEST
Shoes
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The Austempered Steel Toe Boxes with Anchor Flange meet the testing requirements of American Standards Association . . . that's plenty of protection! Comfort, too! Knapp Air Cushioned Innersole assures foot-fresh efficiency through long hours. So — for style, comfort and maximum protection, insist on Knapp Aerotred Saf-Test Shoes!
For full information write Mr. W. C. Sprong, Saf-Test Dept., Knapp Brothers Shoe Mfg. Corp., Brockton 61, Massachusetts

1950 . . . OUR 40TH ANNIVERSARY

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Industrial 200-14L

There's a *Big* difference between Asbestos Gloves and you can *tell* the difference when you get Industrial's 200-14L asbestos gloves. *The quality stands out in* your hands and *on* your hands. Seamless one piece construction from tip to top. No seams at the wrist or working edges to pull out or burn out just when protection is needed most on a hot job. The 200-14L has a knitted cotton lining (not woven) anchored in each finger and in thumb. *The quality stands out* in the correct design and proportions of the big roomy pattern that allow a cool, comfortable fit. They are double sewn. Standard 11, 14 and 23 inch lengths. Other lengths and many special types of asbestos gloves and mittens are available both lined and unlined. The quality of all these items stands out because they are all made of sturdy, close woven 2½ pound per square yard Underwriters grade Asbestos cloth . . . from the best mills in the United States.

Be safe—use Industrial's Safety Apparel backed by 40 years of experience and know-how that means dependable low cost protection for rough, tough service.

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(In Canada: SAFETY SUPPLY CO., Toronto)

THE Future SHOWS

Columbia, S. C.

Nov. 28–29. Thirteenth Annual South Carolina State-Wide Industrial Safety Conference. (Wade Hampton Hotel). John W. Duncan, P. O. Box 539, Columbia, S. C.

Cleveland, Ohio

Jan. 15–18. Second Plant Maintenance Show and Conference. (Auditorium). Exposition Management: Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Philadelphia, Pa.

Seventeenth Annual Philadelphia Regional Safety Conference and Exhibit, February 6–7, 1951. (Bellevue-Stratford Hotel) Walter Mathews, manager, Philadelphia Safety Council, 17th & Sansom Sts., Philadelphia 3, Pa.

Emergency Lighting

(From page 43)

of sudden, unexpected light failure is there, investigate all of them before you make this important purchase. In the long run you will find this investment, in the safety of your employees and patrons and the reputation of your business, money well spent.

If your establishment needs emergency lighting, by all means, put it in now. You, your employees and customers will feel a lot better, once you have protection against sudden, unexpected blackouts. Don't try to scrimp or cut corners. Give your emergency lighting the same consideration that you give other essential equipment. It is going to be a permanent installation so consider it in terms of insurance and protection for many years to come.

Pictures by courtesy of the Electric Cord Company.

New York, N. Y.

Twenty-first Annual Safety Convention and Exposition, April 3–6. (Statler Hotel) John Cost, general chairman, Greater New York Safety Council, 60 E. 42nd St., New York, N. Y.

Pittsburgh, Pa.

Twenty-sixth Annual Western Pennsylvania Safety Conference and Exhibit, April 24–26. (Hotel William Penn). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, Inc., 605 Park Bldg., Pittsburgh, Pa.

New Haven, Conn.

Sixth Annual Connecticut Industrial Safety Conference, April 26. Donald H. Ackley, Manager Conn. Safety Society, G & O Mfg. Co., 138 Winchester Ave., New Haven, Conn.

Chicago, Ill.

Fourth National Materials Handling Exposition, April 30–May 4. (International Amphitheatre). Clapp & Poliak, Inc., exposition management, 341 Madison Ave., New York, N. Y.

Syracuse, N. Y.

Central New York Safety Conference & Exposition, May 14–16. (Hotel Syracuse). Walter L. Fox, executive secretary, Safety Div., Syracuse Chamber of Commerce, 351 So. Warren St., Syracuse, N. Y.

Winston-Salem, N. C.

May 16–18. Twenty-first Annual North Carolina Statewide Industrial Safety Conference (Robert E. Lee Hotel). H. S. Baucom, safety director, North Carolina Industrial Commission, Raleigh, N. C.

Chicago, Ill.

Thirty-eighth Annual National Safety Congress and Exposition, October 16–20. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Class C Fires

(From page 20)

is discharged from the fire extinguisher as a finely subdivided dry material. The means of discharge is provided by nitrogen or a carbon dioxide cartridge which builds up sufficient pressure to propel the dry chemical from the extinguisher to the fire.

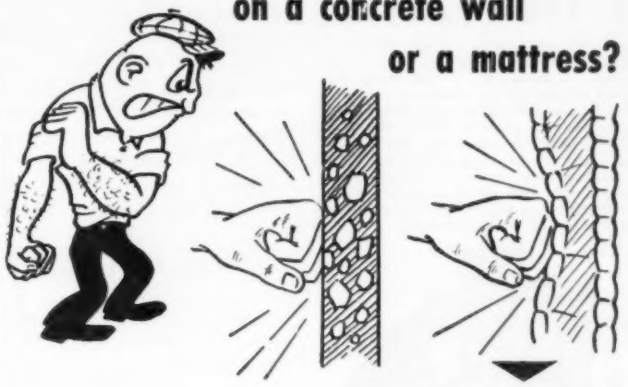
The ultimate action of the dry chemical extinguisher on a fire is very similar to that of the carbon dioxide extinguisher. This results from the fact that the chemical used in the dry powder extinguisher dissociates when in contact with heat to form carbon dioxide as one of the main products. A definite factor to the advantage of this type of extinguisher, however, is the fact that a considerable quantity of heat is required to break down the dry chemical molecule in order to form carbon dioxide gas.

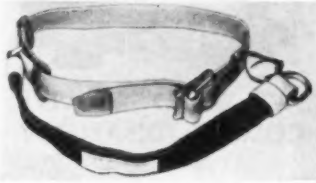
The absorption of heat which takes place using this type of extinguisher should be differentiated from the manner in which the heat is absorbed using the regular carbon dioxide extinguisher or the vaporizing liquid type extinguisher. Heat that is absorbed using dry chemical is what may be termed a heat of dissociation, that is, when the molecule of carbon dioxide is broken away from the dry chemical molecule, heat must be absorbed to bring about the reaction. Quantitatively, the figure for the amount of heat which can be absorbed for each pound of dry chemical discharged on to the fire is approximately 360 B.T.U. per pound. As can be noted, this figure is approximately twice that of the heat which may be absorbed by a pound of carbon dioxide as discharged from the CO_2 type of extinguisher, and is several times the amount of heat which is absorbed per pound of vaporizing liquid.

Dry chemical also has certain other advantages when used to extinguish fires, such as the higher density per unit volume of the dry powder. This higher density enables the dry chemical to be carried very adequately to the fire. Secondly, the carbon dioxide is not released from the dry chemical until it reaches a point in the fire where the intensity of the heat is sufficient to release the carbon

Demonstration of the operating technique for one type of twenty-pound dry chemical extinguisher.

Would you rather land a HAYMAKER on a concrete wall or a mattress?





By elongating a very few inches (depending on amount of fall) the UNOLYN* shock absorber on Safe-Hi Construction Belts furnishes "the mattress" when a falling man hits the end of his lifeline.

No wonder Safety Engineers are saying that Safe-Hi belts are "a long stride forward in construction safety"!

*Product of Flight Safety, Wilmington, Del.

See your safety dealer or write

SPECIFY *Safe-Hi* PRODUCTS

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CAN ASPHYXIA STRIKE WORKERS IN YOUR PLANT?

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SAVE WORKERS LIVES COMBAT DISABILITY with an E & J RESUSCITATOR

YOU HAVE A RESPONSIBILITY to protect your workers from asphyxial hazards, to prevent loss of man-hours, and to minimize company liability for death or injury.

YOUR BEST PROTECTION when asphyxia strikes is the automatic resuscitation action of an E & J Resuscitator. This life-saving instrument breathes for those who are unable to breathe for themselves. Through a face mask it introduces oxygen into the victim's lungs and exhales for him. Because it automatically adjusts itself to lung capacity, the E & J Resuscitator is as safe for a baby as it is for your strongest worker. It is light and durable . . . one person can carry . . . operates on its own oxygen power . . . is easy to use. See for yourself why this safe, efficient instrument is considered essential equipment by industries, rescue squads and hospitals the country over. Send coupon below or write for a demonstration. There is no obligation to buy but you owe it to your company to see the resuscitator in action.

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dioxide from the dry chemical. This, naturally, provides for full utilization of the diluting effect of the carbon dioxide gas upon the oxygen in the atmosphere.

Another factor which serves as an advantage in the use of dry chemical is the fact that the dry powder residue which is left after the carbon dioxide is liberated from the powder will provide a certain measure of protection from easy re-ignition of the fire.

Which Type to Use

Finally, in considering which of these extinguishers might be better adapted to handle a given electrical fire, several very important factors must be borne in mind. First, the size of the hazard itself will govern the size of the extinguisher required. Also, if a small unit is called for, it might be advisable to choose a vaporizing liquid type extinguisher because of the lower cost of this unit.

For snuffing out electrical fires quickly, however, carbon dioxide is excellent, as the large volume of carbon dioxide gas which is produced by this extinguisher is immediately available for reducing the oxygen content of the atmosphere.

Another point in favor of carbon dioxide as an extinguishing agent for class "C" fires is the clean nature of the extinguishing agent. All of the charge at the completion of the extinguishing operation is dissipated as a gas, leaving no solid or liquid residue.

The dry chemical extinguisher, however, is very fast in operation and effective in extinguishing a fire because of the permeating quality of the finely divided powder. Its greater use thus far has been found in outdoor applications.

In summary, it might be stated that vaporizing liquid extinguishers could be used to advantage on fires involved in fuse and switch boxes, electric trolleys, circuit breakers, electric appliances, signal circuits, and similar devices. Carbon dioxide extinguishers, on the other hand, are used extensively for the protection of electric motors, welding equipment, generators, equipment incorporating delicate contactors, and other applications where a flooding action of an inert gas is of importance. Finally, dry chemical, is indicated on electrical fires such as transformers, electric heaters, electric furnaces and the like.

Pictures by courtesy of The General Detroit Corporation.

Safety Shoe Sale

(From page 21) of accidents and the shoe manufacturers were approached for ideas.

It was felt that most of the employees would favor foot protection, provided they did not have to pay for shoes in one lump payment. It was realized too, that each man and woman in the plant had his own problems, with families and bills to meet each pay-day, and we wanted to make it easy for them to get safety shoes.

The Painless Method

The plant management established a Payroll Deduction Plan, whereby an employee could purchase safety shoes and pay for them on convenient and easy terms. Our "painless method" provides for three payroll deductions, at one month intervals.

The next step was to convince the workers that safety shoes were something they should not do without. The objective was to try to get safety shoes on every worker by persuasion. There was to be no compulsion.

The Safety Department, the Plant Doctor and nurses, all levels of supervision and management, started the campaign by telling the employees at every opportunity that safety shoes were a good bargain, that they were comfortable to wear, but mostly stressing the protection against foot and toe injury.

Four weeks before starting to sell the shoes, appropriate posters were placed on all the bulletin boards in the plant. These posters

all emphasized how safety shoes could prevent injury.

The manufacturer provided payroll inserts that described the value and styles of the safety shoes. Safety shoes were displayed in each of the cafeterias, and employees were able to handle and inspect the shoes. Large posters were made up explaining where the shoe-store would be located, the hours it would be open, and the kind of safety shoes that would be sold.

This was all ground-work before the opening of the shoe-store itself. The shoe-store was placed in the most convenient location for all employees inside the plant.

Results of the Campaign

The actual selling was a co-operative arrangement between the manufacturer and the plant. The fitting was done by the manufacturer's representatives, while the recording of size and style on individual cards, and the handling of the payroll deduction cards and sales slips were executed by two of the plant employees. Sales were speedily written in triplicate by means of a standard register machine.

Open for a total of 81 hours of selling time, the shoe store sold 1600 pairs of safety shoes of which 83 pairs were for women. More women's shoes could have been sold then and there if the necessary sizes had been in stock. Women employees were favorably impressed by the neat and smart appearance of the styles shown.

Selling hours at the store were arranged so as to accommodate the employees on all three shifts. Passes were issued enabling the workers to purchase shoes during their regular working hours. Of the 1600 pairs of safety shoes sold, nine out of ten were bought on the Payroll Deduction Plan.

The employees were pleased with the styles, fitting and the service. There was no subsidizing of shoes, but they were sold at manufacturer's cost price plus the State sales tax. The three payroll deductions at one month intervals were important factors in the success of the sale. As a matter of fact, practically every employee spoke of the "painless method," and many of them expressed appreciation for making it possible to buy safety shoes on this basis.

Since the sale closed there have been two cases reported where the safety shoes were a definite factor in preventing toe injury, and during the same period there have been two cases of fractured toes reported, neither of the individuals involved having bought safety shoes. There have been probably a half dozen complaints about the shoes being defective, or not fitted properly, and in every instance the manufacturer has made rapid and satisfactory adjustment and correction.

With more than 30% of the employees now wearing safety shoes, and with added interest on the part of those other employees who have not yet purchased them, this plant

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SAF-I-SHIELD
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SAF-I-SPEC
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• Instant snap-on temples (lens inter-changeable with SAF-I-DUO)
• Genuine comfort
• Rugged—tough
• Optically correct
• Low Cost
• Made of Optilite
SAF-I-DUO
• Replaceable, inter-changeable lens (lens inter-changeable with SAF-I-SPEC)
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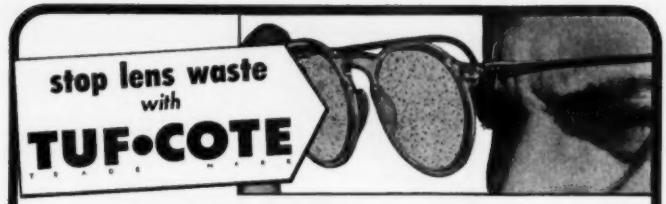
Write for literature and prices
UNITED STATES SAFETY SERVICE CO.
Kansas City 6, Missouri • Branches in Principal Industrial Cities



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Safety lenses last 7 to 15 times longer against weld spatter and grinding wheel pitting when TUF-COTE treated. TUF-COTE is a microscopic layer of glass-like substance that resists the high temperature sparks that cause pitting. Any glass lens can be treated. We can treat your lenses or give you any type or brand of lens, TUF-COTE treated. We also supply treated prescription lenses to order. TUF-COTE is crystal clear and optically perfect.

TUF-COTE processing may be ordered through Bausch & Lomb distributors or at any of the following:

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Illinois
Universal Safety Equipment Co., Chicago
Kentucky
Orr Safety Equipment Co., Louisville
Michigan
Argus Supply Co., Detroit
Averill Equipment Co., Detroit
Seco Safety Products Co., Detroit
Minnesota
Continental Safety Equipment, Inc., St. Paul
Missouri
Safety Incorporated, St. Louis; Kansas City
New York
Safety Optical Service, Rochester
Ohio
Helmerichs Supply Co., Cleveland
Williams & Co., Inc., Cincinnati, Cleveland; Columbus; Toledo
White Haines Optical Co., Columbus
Pennsylvania
Guardian Safety Equipment Co., Philadelphia
Williams & Co., Inc., Pittsburgh
Rhode Island
Welsh Manufacturing Co., Providence
Tennessee
Industrial Supply Co., Chattanooga
Virginia
Southeastern Optical Co., Inc., Richmond
Wisconsin
Louis F. Pagel Co., Milwaukee
Canada
Bausch & Lomb Optical Co., Montreal, Toronto
Industrial Safety Equipment Co., Ltd., Etobicoke, Ont.

WALLACE OPTICAL COMPANY · INC
1025 Brush Street
Detroit 26, Michigan

has a good measure of protection against the painful and costly foot and toe injuries.

The sale should bolster the overall Safety Program too, by helping to keep both employees and supervision thinking "Safety" at all times. Just wearing safety shoes makes one conscious of the need for doing the daily jobs safely.

This progress in foot protection does not mean that supervision will relax their safety efforts in any way. The CELANESE CORPORATION OF AMERICA has a genuine regard for human life and happiness and expects its Foremen and Supervision to have that same regard. This response to the Safety Shoe Sale will be emphasized at Supervisory and Safety meetings as a means of encouraging the other phases of the plant's Safety Program.

From the gratifying results of the sale, it is evident that employees will buy, and will wear, safety shoes, provided they are convinced of the real protection the safety shoes will give them, and provided too that they are easy to obtain and convenient terms of payment are arranged.

Giving the sale ample advance publicity; giving employees the opportunity to see and handle the shoes for themselves for several weeks before the sale, coupled with the intense interest that was shown by the plant management and supervision, all served to persuade the workers that safety shoes were the best protection for their feet and toes.

The Payroll Deduction Plan is not proving too heavy a clerical, nor accounting burden, particularly when consideration is given to how much this Safety Shoe Sale is stimulating employee relations at this plant.

Pictures by courtesy of the Celanese Corporation of America.

SAFETY CENTER

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Oil Organizes for Safety

(From page 26) best and most widely accepted thoughts on safety matters when it is necessary to have the industry's thinking presented on an inter-industry level, e.g., A.S.A. Safety Standards; preparing and recommending standards or safe practices where public interest or the extent of a hazard within the industry requires that such standards be issued for industry information or reference use by public officials.

The vulnerability of the industry to public and governmental criticism if any general lack of safety develops is usually recognized, but individual company safety programs are only as good as a particular management desires or demands. In some instances A.P.I. recognition of safety has been peculiarly effective in arousing management interest and support through A.P.I. recognition of outstanding safety accomplishments and A.P.I. endorsement of safe practices.

Committee members feel that the overall program is of unquestioned value to the industry. Statistics on potential costs of accidents prevented are speculative, as only accidents which do occur in spite of

IMPORTANT to Eye Safety

K-LENS-M Modern Liquid Lens Cleaner for Glass and Plastic

K-LENS-M liquid lens cleaner gets eyeglasses and goggles clean for clear vision . . . so important to safety.

K-LENS-M does the job faster, at lower cost, and with less maintenance. Thoroughly cleans glass or plastic eyewear without scratching, streaking, or leaving a film.

The K-LENS-M Dispenser Cabinet is a complete lens cleaning unit, specially designed for easy installation, use, and service.

Ask for the K-LENS-M folder—full information to help you save money on eyewear cleaning.

NEW Large Size K-LENS-M Handy Molded-Shape Bottle. Holds 42% More K-LENS-M. Economical—fewer re-fillings. Hundreds of Film-Free Cleanings!

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Complete Lens Cleaning Station

Finger-Tip Spray Dispenser—
No air pressure needed.
Dispenses Tissues—one at a time.
Disposal Space for used tissues.
Special Paint Grip Steel Cabinet.
Acid-Resistant Baked Enamel Finish.

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CORTLAND 2, N. Y.

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safety efforts are shown in dollars and cents in the profit and loss statements. The benefits derived from public esteem and community acceptance are equally difficult to evaluate, but there is no question of the cost if the lack of these assets causes communities to impose unreasonable restrictions.

The Central Committee on Accident Prevention is constantly making progress in its endeavors, but its problems are renewed with every new process or method and with every new recruit among workers or management. Therefore, in its broad aspects, the work of the committee should be regarded as a continuing function.

The Central Committee on Accident Prevention supervises the work of the Committee on Awards; Committee on First Aid; Committee on Accident Statistics; Committee on Design and Guarding New Equipment; Committee on Safety in Drilling and Production Operations; Committee on Natural Gasoline; Committee on Pipe Line Safety; Committee on Safe Marketing Practices; Committee on Personal Protective Equipment; Committee on Gas and Electric Cutting and Welding; Committee on Tank Cleaning; and Committee on Visual Aids.

World War II had the same effect on accident prevention activities that it had upon fire protection work, and it became increasingly difficult for the committees to assemble for meetings. In 1942, the director of the Department of Accident Prevention was released to the Petroleum Industry War Council and the accident prevention activities were reassigned to the Department of Engineering.

Department of Safety

The effectiveness of organized accident prevention effort was well established, however, and when the war ended the companies again clamored for Institute activity in that direction. In 1946 the Board of Directors approved appointment of a Safety Committee of the Board and authorized creation of a Department of Safety in which all accident prevention and fire protection activities of the Institute would be concentrated. The Department of Accident Prevention was officially terminated on December 31, 1946, and the new Department of Safety was fully organized on January 1, 1947. With its name changed and its functions expanded to include the administration of all committees and related activities of the Institute pertaining to accident prevention and fire protection, the Department proceeds towards the following objectives: to facilitate and expedite the gathering, compiling, and disseminating of information of value to oil companies in the protection of employees and property against injury, and in the defense of the industry and the public against unreasonable laws, ordinances and

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regulations.

In addition the Department provides an industry forum for the discussion of accident prevention and fire protection in all branches of the industry. Included in the departmental activities are:

A. The handling of secretarial work for one committee of the Board, two central committees, and nineteen subcommittees.

B. Annual solicitation, compilation and distribution of statistics and information on:

(1) Disabling Injuries in the Petroleum Industry

(2) Motor-Vehicle Accidents in the Petroleum Industry

(3) Causes of Fatalities in the Petroleum Industry

(4) Fire Losses in the Petroleum Industry

C. Preparation and issuance of 3 bimonthly information circulars:

(1) "Accident Prevention Information"

(2) "Accident Prevention Information for Marketers"

(3) Fire Protection Circulars

(A bulletin of general interest on petroleum safety is also issued, although not on a fixed schedule.)

D. Editing necessary for revision and reissuance of publications:

(1) Accident Prevention Manuals

(2) *Fire Protection in Refineries*

E. Coordination of Institute activities with those of other agencies including:

(1) American Standards Association

Safety Code Correlating Committee and its Sectional Committees

(2) National Fire Protection Association and its Technical Committees

(3) National Safety Council—Petroleum Section

There is no measure of the extent to which this activity within the Institute has been a factor in the industry's constantly improved record of industrial injuries, but, judging by the time and effort devoted to it by oil company safety supervisors, the results must be worth while. The bare expense of maintaining such an organized activity is small when compared to that incurred by the committee members in time and expense incident to meetings and the conduct of committee assignments. As long as oil companies authorize their supervisors to accept membership on active committees it must be assumed that the committee work is deemed worthy of continuation. Because, it immediately becomes apparent that, while the progress of petroleum safety is still a function of the progress of the managements of the individual companies, those companies, far from considering the Institute's part insignificant, consider it as of utmost importance to their operation.

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Check List of Products—p. 72

(From page 16) the need for design variations such as the need for dry pipe systems in those parts of buildings that are unheated in freezing weather.

For proper operation of sprinkler systems care must be observed to keep stock and other obstructions at least 18" below sprinkler heads. New partitions should not be erected until adequate revision of the sprinkler system will give protection to the new layout. Sprinkler heads should be selected with regard for the normal temperature of the location. Similarly special noncorrosive types of heads may be needed where acid fumes etc. would result in corrosion of heads. Loading of heads with cement, paint or other insulating material must be prevented. Frequent change of heads may be necessary to meet this problem.

So that water damage may be minimized and to provide instant knowledge of fire, a sprinkler water-flow alarm system should be provided.

The sprinkler supply tank should be confined preferably to fire fighting purposes. In order to supply the storage tank and to maintain pressure on the system during the course of the fire, adequate fire pump capacity must be provided.

Stand pipes with attached hose may be desirable to provide ample water supply for spot use within the building. They may be 2½" or 1½" fire hose sizes. In the yard and around the buildings at strategic intervals, hydrants should be located for the use of the plant fire department. Hose couplings and hydrant nipples should be American Standard 2½" fire hose thread. In the past many sizes of hose couplings were manufactured and sold, and frequently it was impossible to interchange hose or apparatus between one fire protection system and another.

4. Plant fire brigade. Fighting a fire requires manpower. Each department in the plant should have individuals designated and instructed in the use of portable fire extinguishers. A central fire fighting organization or brigade should also be organized with a Chief (frequently the Master Mechanic) and Assistant Chief so that the fire protective facilities of the plant may be used to their best advantage. The brigade will comprise one or more fire companies whose captain may be a department foreman. Each company will comprise about ten men. The boiler watch engineer, electrician, and watchmen should be included in the fire department personnel.

5. Watchman service. Important in any plant to fire protection is an adequate force of watchmen. Clock positions should be located in strategic portions of the plant so that the whole plant will be covered in the watchmen's hourly rounds. The function of the watchman is to observe what is going on in the plant during the hours that it is left pretty much alone so that any small fire or condition which

PLANT SAFETY

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will lead to a fire may be remedied and eliminated or controlled before much damage has been done. A watchman should be an able-bodied man in good physical and mental condition. If he is not well or strong, he will be less attentive to the necessary observations in the course of his rounds and may even be able to avoid complete coverage of the territory which he is supposed to control. Incidentally, most of the many accidents involving watchmen result from physical deficiencies which prevent them from seeing hazards in their path or involve lack of sure-footedness resulting in their stumbling and falling on stairways. A watchman has an important job and it should be filled by a man who has the specific qualifications to do the job competently.

Alarm systems for fire detection and supervision of watchmen and fire control equipment may be of several types and be part of an independent central station system or be entirely local to the protected plant. Fire detection alarms may be thermostatic, electronic, or hydraulic indicating sprinkler water flow. Watchmen's key stations provide supervisory control of their activities. Alarms may also indicate closed sprinkler valves, leakage, tank water levels, air pressure in dry pipe systems, etc. In certain occupancies having heavy population, manual and automatic general alarm systems are important to worker safety.

Certainly the protection of a plant must take into account the control of all catastrophe possibilities, such as the explosion of a boiler or other pressure vessel, an air tank or accumulator. Periodic inspection and maintenance of such equipment is a necessary requirement to their safe use. Not only will the explosion of such equipment put it out of operation, possibly permanently, but the violent disruption may frequently destroy a good portion of the plant. Similarly, rotating machinery, turbines and flywheels especially need proper control and maintenance in order to prevent over-speed resulting in damage to the machine and to the location into which the broken portion may be projected. Over-speed stop devices on such equipment are necessary.

(Continued in the December issue)

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State of New York, County of New York, ss. Before me, a Notary Public in and for the State and County aforesaid, personally appeared Arthur Snyder, who, having been duly sworn according to law, deposes and says that he is the business manager of SAFETY MAINTENANCE AND PRODUCTION, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management and circulation of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers, respectively, are: Publisher, Alfred M. Best Co., Inc., Executive Offices, 75 Fulton St., New York, N. Y.; Editor-in-Chief, Alfred M. Best; Editor, Harry Armand; Business Manager, Arthur Snyder, all of 75 Fulton Street, New York, N. Y.

2. That the owner is Alfred M. Best Company, Inc., 75 Fulton St., New York, N. Y.; and that the owners of 1% or more of the stock are:

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3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and securities holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect in the said stock, bonds or other securities than as so stated by him.

ARTHUR SNYDER,
Business Manager.

Sworn to and subscribed before me this 13th day of September, 1950.

ELIZABETH BRENNER
Notary Public, State of New York. Qualified in Kings County No. 557, No. 24-0407700; Certificates filed in New York & Kings; Registers' Offices & N. Y. Co. Clerk's Office; Term expires March 30, 1951.

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

Solvents in Small Plants

ACCIDENT frequency and severity rates in small plants are roughly double those of large plants, and the smaller the plant the higher the accident rates, G. E. Johnson, Assistant Chief of the Division of Industrial Safety of the State of California, recently pointed out.

The small plant owner may be unable to afford a safety engineer charged with nothing but accident prevention, but he cannot afford to be without a safety program, according to Mr. Johnson, and the owner himself must direct and guide the program. He underscored the importance of safety by pointing out that in the small plant one bad accident can wipe out several years' profits. He stressed also that "Little good is accomplished by safety propaganda in irregular and infrequent doses . . . safety mindedness is achieved only by the constant attention to safety in every phase of the day's work."

Where solvents are used, "safety in every phase of the day's work" requires:

1. *Knowledge of the hazards of the solvent employed.* The manufacturer's label usually provides information on these properties. Such information should also be put on any small containers of solvent withdrawn from the original drum so that the facts are kept before workers using these containers.

2. Where solvent is used constantly or frequently, *properly engineered systems and equipment* to prevent escape of solvent vapor into the working atmosphere and unnecessary wetting of the hands with the liquid.

3. Where solvent is used only occasionally, *either personal respiratory protection or suitable temporary ventilating arrangements* which will protect workers from the solvent vapor.

4. *Control of solvent distribution in the plant* so that one person charged with the responsibility of issuing solvent will know who wants it and what for.

5. *Regular and frequent servicing* of solvent-using equipment, ventilating systems, and personal protective equipment to make sure that all are in good working order.

6. *Good housekeeping* so that spilling and careless handling of solvents are avoided, accidental spills are wiped up promptly, and solvent-soaked rags or wastes are disposed of in airtight containers.

7. *Immediate attention to complaints of discomfort or illness* which suggest that there is exposure to solvent vapor or that the individuals complaining may be unusually sensitive to the vapor. Medical examination may prove desirable to verify or refute the cause. It may also be desirable to have an analysis of the workroom air made by a chemist.

The small plant owner who needs help in setting up a solvent safety program or on periodic checks on the safety of his plant can usually obtain it without charge from his state or city industrial hygiene service.

—Safety Research Institute

Prominent Hygiene Executive Dies

JOHN F. McMAHON, Managing Director, Industrial Hygiene Foundation of America, Inc., Pittsburgh, died suddenly in his office on Friday, September 15. At the time of his death, Mr. McMahon, an Administrative Fellow, was rounding out his fourteenth year as a member of the Institute and his eighth as Managing Director of the Industrial Hygiene Foundation. Since his arrival at the Institute in 1936, he had risen to a position of prominence in a field of increasing importance to industry and to the nation as a whole—the health and well-being of workers on the job.

John McMahon's early years were spent as a newspaperman. Indeed, his abilities in the field of public relations were responsible for his joining the group of engineers and scientists who *(Continued page 60)*

THE *Why* AND *How* OF PLANT SANITATION

By VICTOR E. LAVETTER
Industrial Hygienist
Bureau of Industrial Hygiene
Detroit Department of Health

Here is a practical guide for management and safety engineers as well as industrial hygienists in providing a safe, healthful and efficient working environment.

PART II

Continued from the October 1950 issue of SAFETY MAINTENANCE & PRODUCTION. In Part I, Mr. Lavetter discussed two of the objectives of plant sanitation: Plant Air Sanitation, and Plant Water Sanitation.

Personal Service Facilities

EVERY place of employment is expected to have at least one toilet room containing at least one water closet and one lavatory. In establishments employing more than five persons, it is customary to provide separate properly designated toilet and washing facilities for each sex. Where more than ten persons of the same sex are employed, Table I gives a simplified approximation of the toilet facility requirements of several codes. According to this schedule, one water closet, one lavatory, and one urinal would be required for 11 to 30 males. A desirable space allotment would be 150 cubic feet per toilet bowl, subject to a minimum of 16 square feet of floor area; and 100 cubic feet for each urinal or lavatory, subject to a minimum floor area of 12 square feet per facility. In toilet rooms containing more facilities than one lavatory and one water closet, each water closet should be enclosed by partitions and a self-closing door extending from at least six feet to within one foot above the floor. Separatory partitions for urinals are also desirable.

An adequate supply of suitable toilet paper should be available adjacent to each toilet bowl. A covered waste receptacle is necessary at each water closet in toilet rooms designated for females. These receptacles should be emptied at the end of each shift or more often where indicated. Some individuals object to using a bare toilet seat and spread toilet paper or paper towels to cover the seat. Many of these fastidious persons rarely, if ever, bother to see that such makeshift seat coverings are properly disposed of. The result is that the drains become blocked by paper towels, and the floor becomes littered with towels and toilet paper. A desirable means of correcting this situation is to provide suitable dispensers with ample supplies of paper toilet seat covers in every toilet room. Some toilet seat covers are designed with a trailing ribbon of paper so that the cover is automatically drawn down the drain when the toilet is flushed.

Additional washing facilities are required for the use of employees exposed to toxic, irritating, greasy, oily or dirty substances, or to any dust, fume or mist, or to any condition of temperature, humidity, or such physical exertion as to cause noticeable perspiration. Such washing facilities should be apart from those rooms containing water closets. Trough wash basins or trough urinals should be so arranged as to provide at least 24 inches of unobstructed fixture periphery

TABLE I

Maximum Number of Persons per Fixture	Males	Females
Water Closet	30	20
Lavatory	40*	40*
Urinal	60	—

*Subject to additional requirements according to occupational exposure

TABLE II

Lunch Room Areas Number of Persons	Recommended Square Feet Per Person
Less than 25	8
25–74	7
75–149	6
150–499	5
500 or more	4

TABLE III

Number of Women Employees	Number of Beds or Couches
10 to 100	1
100 to 250	2
Over 250	1 additional bed for each 250 additional women

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for each user. Where a wash room for one sex is situated in close proximity to a toilet room designated for the same sex, these washing facilities can be counted toward the toilet facility requirements. About 50% of the additionally required washing facilities should be in the form of shower baths.

A suggested allotment of washing facilities is as follows:

(a) One washing facility for each five persons exposed to toxic, corrosive, irritating, greasy or oily substances.

(b) One washing facility for each ten other persons exposed to conditions not covered by (a) where dirt, dusts, mists, fumes, or noticeable perspiration occur.

Several codes specify one lavatory for each ten employees up to 100, and one for each 15 additional employees above 100, irrespective of the occupational exposure. In addition, these codes specify one shower bath for every 15 employees exposed to excessive heat or to skin contamination with poisonous, infectious, or irritating material.

Most shower baths are installed with the shower head six to seven feet above the floor. Shower partitions should reach from the floor to at least the height of the shower head. The minimum horizontal dimension for each rectangularly arranged shower facility should be about 36 inches; and in the case of circularly arranged facilities, the minimum dimension for either the radius or the chord subtending such a facility should be about 42 inches. Shower-regulating controls should be on a side wall, rather than the back wall of each shower compartment.

Water supplied to washing facilities must meet the standards applicable to drinking water. Adequate provision should be made for temperature adjustment of washing water to within the range from 95°F to 125°F at the point of use. The Detroit Plumbing Code specifies the volume of either hot or cold water required per washing facility to be 3 gallons per minute, and 4 gallons per minute for each shower bath.

The design, construction, and installation of plumbing fixtures should be such that the fixtures and spaces around them can be maintained in a sanitary condition with a minimum of effort.

Every plumbing fixture must be connected to a suitable sewer system with an intervening non-siphoning gas trap. The riser for every drain and soil pipe shou'd be vented to the outdoors.

Coved junctions between floors, walls, and partitions, and the elimination of dirt-collecting cracks and crevices serve to simplify cleaning maintenance. Floors, walls, and partitions should be constructed of or finished with materials capable of withstanding repeated washing without absorption or leakage.

Desirable toilet room layouts are so arranged that every person using a toilet facility will pass a suitable washing facility immediately subsequent to such use, usually in close proximity to the room exit. All openings into toilet and wash rooms should be so protected

Figure 5. A well-ventilated group of lockers. Air is exhausted through grill into a duct at the locker base. Sloping tops on the lockers facilitate cleaning and the elevation of the units above ground level helps in the maintenance of floors.

that users will not be visible from outside such rooms during their use. Although it has been customary to ventilate toilet and wash rooms on an air-change-per-hour basis, it would appear to be more practical to base such ventilation on the number and type of fixtures involved. Perhaps a figure of 100 cubic feet of air per minute per water closet, and 50 cubic feet of air per minute for each other facility in toilet and wash rooms might make a more desirable basis on which to figure such ventilation.

To be satisfactory, personal cleansing agents must be capable of removing soil without adversely affecting the user. Cleansing agents containing harsh abrasives or excessive amounts of alkali are undesirable. It is usually preferable to furnish skin cleansers in granulated or liquid form in suitable dispensers, rather than in bar or cake form.

Towels must not be used in common by several persons as skin diseases are easily transmitted in this manner. It is difficult to control the manner in which endless roller-type cloth towels are used and they are, therefore, undesirable. Cabinet-type cloth towels may be satisfactory if an adequate unused portion of clean towel is released for each user and provision is made for prompt refilling of the cabinet when towels are used up. Where sanitary paper towels are furnished, suitable receptacles must be strategically located to encourage proper disposal. Drying devices other than cloth and paper towels may be furnished if adequate drying can be satisfactorily accomplished without exposing the user to possible illness, injury, or discomfort.

In recent years, the trend of health authorities has been to question the use of fungicidal foot baths in shower rooms. If foot baths are desired to allay apprehension over "athlete's foot" contagion, careful choice of the product and maintenance are vitally necessary.

To be suitable for the purpose, facilities for the storage of employees' personal effects should afford sufficient ventilation to air and dry out clothing and towels during the storage period. Figure 5 shows an unusual and well-ventilated group of lockers photographed in a Detroit plant. Air is drawn in through louvers near the top of each locker door and out through a grill into a duct at the locker base. The centrifugal exhaust fan discharges the air from this duct directly to the outdoors. Sloping locker tops prevent the accumulation of refuse and are easily kept clean. Since the lockers are elevated to provide for the ventilating duct, and the doors clear the benches, an economy of locker room space is effected by attaching benches to the locker bases. In certain cases, it may be desirable to provide lockers with divided compartments so as to separate street clothing from work clothes. Where space is at a premium, overhead space has been employed for clothing storage to good advantage. Some plants use a pulley arrangement to raise and lower clothing racks. Others provide hangers on poles some five or six feet in length so that they can be hung on overhead hooks. Both of these arrangements must be carefully located so as to provide adequate natural ventilation and avoid exposure to dusty or other objectionable conditions. Toilet rooms are generally unsatisfactory for clothing storage, whether lockers are provided or not. Storage facilities for employees' personal effects must be reasonably secure against tampering, particularly if cloth towels are stored by each individual worker for his own use.

Eating Facilities

Every place of employment should designate suitable clean areas where workers may partake of their lunches. Covered receptacles should be strategically located in such areas for the disposal of lunch refuse. Table II shows the recommended lunch room space allotment as given in several codes. Bringing food into areas where toxic substances are present should be prohibited. To encourage good practice, it may be desirable to provide a cool or refrigerated storage facility for food carried into the plant by workers. The location of food storage and dining facilities should be sufficiently convenient that workers will have no reason to ignore them.

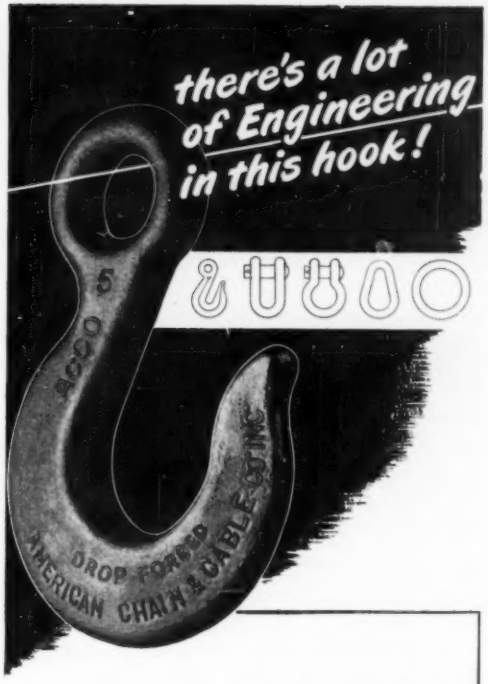
Most food poisoning outbreaks are the result of allowing foods to stand at near-room temperatures, at which certain foods may become unsafe within an hour. Food requiring refrigeration should be kept at

temperatures below 50°F, preferably between 35°F and 40°F. Even at these temperatures, many foods may not be safe if kept more than two days. It is a simple matter for the Safety Engineer to check the temperature at which foods are stored and periodically to inquire into the length of time certain foods have remained in storage. This is particularly important whenever workers complain of the unpalatability of food sold in the plant or of illness which may possibly be associated with such food.

The construction of kitchens and food storage rooms should be such as to eliminate cracks and crevices in which vermin may find refuge or accumulations of material on which to feed. While kitchen help may find hard-surfaced floors tiresome on which to work, in the interest of sanitation a smooth-finished concrete or terrazzo floor with coved wall junctions and properly sloped to suitable drains is to be recommended, particularly in the case of a kitchen located in the basement or on the lowest floor of the building. Suitable duckboards or matting may be provided in front of cook stoves, workbenches, and other areas to reduce the tiring effect of the hard floor on kitchen help.

The control of heat, vapors, and odors from steam tables, cooking, baking, frying, and dishwashing is usually accomplished by local exhaust ventilation through canopy hoods. The height of such hoods should be not less than six nor more than seven feet above the floor, and should extend some ten or twelve inches in every horizontal direction beyond the equipment or to the wall if it is nearer than twelve inches. The volume of air exhausted by such hoods should be 100 cubic feet per minute per square foot of hood opening. If the airflow is not uniformly distributed throughout the hood, sufficient air should be exhausted so that the velocity will not be less than 50 feet per minute in any part. Enclosed canopy and slot exhaust hoods have also been effectively used in kitchen ventilation. The use of grease filters is recommended, and where used, careful attention is necessary to either replace or clean them frequently in order that the system may function efficiently. Where kitchens are located in basements or semi-basements, it is necessary to supply clean, tempered, fresh air in approximately equivalent volume to that being exhausted. Windows in such kitchens should be designed for illumination only, and not capable of being opened. Exterior doors should be self-closing. The supply air should be introduced in the dining area, from which it passes into the kitchen. Supply air for food storage rooms should come directly from the outdoors through intervening filters.

In plants where restaurant or cafeteria services are maintained, the problem of keeping foods on steam tables and display counters is easily met. Better managed cafeterias display only the amount of perishable food required for about the next 20 to 30 minutes' service. If it is impractical for the plant to provide cafeteria or restaurant services, some plants arrange



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with outside caterers to bring in prepared foods which are sold from lunch carts. In such cases, the time-temperature factors are more difficult to control; and the Safety Engineer should exert greater vigilance. It is not uncommon for such lunch carts to be prepared several hours before the food is to be served, particularly in the case of night shifts. Some lunch carts are provided with electrical connections for keeping foods hot until served, and these should not cause any trouble. Foods requiring refrigeration may be iced or kept in a dry-ice compartment. Unless good controls exist, it would be wise to check time-temperature factors frequently.

Cooking and food-serving utensils must not impart any foreign flavor or toxic substance to the food. Cracked or chipped china should be discarded. Stainless steel tableware is probably the easiest to keep in usable condition. A good dishwashing procedure is to scrape and prewash dishes before the soapy or detergent wash. Prewashing is generally required in the case of dishwashing machines. Thorough washing is then followed by a hot water spray rinse at 170°F or higher, after which the basket of dishes is immersed in a disinfecting solution for at least 2 minutes. It is not necessary to wipe dishes dry after this procedure. In fact, air drying is preferable. The use of sanitary paper cups and plates reduces dishwashing materially and has been found quite satisfactory. Separate handwashing facilities should be provided in the kitchen.

In some municipalities, food handlers must be approved by the Health Department before they can be employed. In order to receive such approval, which usually expires annually, a physician's certificate must be presented indicating that the applicant was recently examined and found free of any communicable disease. A further requisite is attendance at a class in sanitary food-handling technique. It would be desirable, even in areas where there are no regulations, to provide preemployment and periodic physical examinations along with instruction in sanitary technique for all food handlers. County or State Health Departments can assist in obtaining suitable instruction material where no local instruction is available.

In regard to rest rooms, there are occasions on which some workers, particularly women, may experience incapacity to work for a short period of time. Frequently, the afflicted person is able to return to work after 15 to 30 minutes' rest. Unless a place is provided where the employee may recuperate, he or she may be forced to take the balance of the day off. Several codes specify that establishments employing women must provide such resting facilities. Where less than ten women are employed, a temporary type of reclining facility is regarded to be sufficient if the user is properly screened from view. Table III gives the number of reclining facilities recommended for varying numbers of women. The space specified for rest rooms is 60 square feet for ten women or less, plus at least two square feet for each additional woman.

Plant Cleanliness and Orderliness

It has been my observation that no place is regarded to be clean unless it looks clean. If surfaces are dark and poorly illuminated, most persons will assume that the sanitary condition is unsatisfactory. Persons having refuse to dispose of usually will not hesitate to drop it in any area that appears to be untidy, or where it will seem to be inconspicuous. It is, therefore, desirable to choose the lightest colors consistent with other practical considerations in selecting paint for any part of the plant. Unsatisfactory general illumination levels can be somewhat improved by the use of lighter paints. Paint experts should be consulted regarding formulas required for various applications, such as old or new painted or unpainted wood, metal, plaster, masonry, high humidity, excessive heat or cold, corrosive vapors, etc. Selection of the wrong type of paint, in addition to the direct cost of having to repaint sooner, makes cleaning maintenance more difficult.

Periodic window cleaning is important from the standpoint of both good employee morale and satisfactory levels of illumination. Welding, heat-treating, and foundry pour-off departments probably require more frequent window cleaning than other areas of

the plant, excepting offices.

Dust can be somewhat suppressed by the application of commercially available compounds to smooth floors and aisles. Wetting agents are used on dirt or sand floors and aisleways in foundries and similar establishments to good advantage. Most foundrymen fear a spill of molten metal near a puddle of water. Wetting agents enable the dirt or sand to become more easily wetted for dust suppression. In this manner, dust suppression is more readily accomplished with less water and the hazard of puddles can be eliminated.

In spite of many years of active effort on the part of industrial hygienists, there is still excessive use of compressed air blow-off as a cleaning method. Dry sweeping is another source of workroom air contamination which should be reduced or eliminated. Both of these cleaning methods produce only a temporary effect as most of the suspended dust resettles where it will require further cleaning in a short time. Vacuum cleaning should be substituted wherever possible. The failure of most vacuum cleaners to perform satisfactorily is due to the choice of too small a unit for the job, or selection of one that is difficult to clean out so that its maintenance becomes neglected. The importance of replacing compressed air blow-off and dry sweeping with vacuum-cleaning methods cannot be overemphasized.

Another means of dust suppression and goodhousekeeping control is the selection of suitable containers for raw materials, goods in process, finished products, and process wastes. Containers which have a tendency to leak should be eliminated. Where raw materials are shipped in containers from which leakage is unavoidable, plant trucks, trailers, and skids should be designed so that such material does not fall to the floor. Provision should be made for prompt clean-up of accidental spillage.

The sanitation of toilet rooms, in my experience, was found to be neglected more than any other part of the plant. Perhaps it is because the person assigned this duty feels it is degrading, or perhaps it is because he just doesn't know how to handle the job. In small plants, nobody wants to get stuck with this chore. One firm, of several in the business, provides cleaning chemicals and personnel to use them in removing grime and keeping toilet bowls clean at a cost as low as 60 cents to 75 cents per unit per month. Only water closets and urinals are serviced in this manner. Such a service accomplishes the most disagreeable part of toilet room maintenance at regular intervals and enables plant personnel to devote more time to other phases of toilet and wash-room sanitation.

Last, but not least, is the problem of vermin control. Traps, poisons, fumigations, and other methods have been employed with varying degrees of success. Sanitation of premises cannot be stressed too strongly as the most important factor in vermin control. Sources of food and places where vermin may find harborage must be carefully eliminated. If you properly build

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them out and starve them out, the need for traps, poisons, and fumigations should be minimal. Galvanized wire cloth fly screening should have 16 to 18 meshes to the inch and should be used in all openings to dining areas, kitchens, and toilet rooms. Openings larger than ½ inch by ½ inch should be protected with 19 gauge or heavier galvanized hardware cloth, three meshes to the inch, or finer, if accessible to rats. This applies to openings within four feet above the ground or which rats are capable of reaching by climbing. The lower 8 inches of grade-level doors and casements may be rat-proofed by the application of 24-gauge galvanized sheet metal flashings. Concrete rat walls must be at least 4 inches thick and extend at least 3 feet into the ground to be considered rat-proof. L-shaped rat walls have been found to be even more effective. Refuse containers, both indoors and out, should be tightly covered. All material storage should be arranged so that vermin will not find harborage. Wherever possible, materials should be stored on platforms or shelves one foot or more above ground. Adequate aisleways should be left around stored materials for cleaning and inspection.

The presence of rats, mice, and their runways can easily be detected by dusting the suspected areas at closing time and checking for tracks the following morning. If their presence is demonstrated, the first step would be to improve housekeeping so as to eliminate sources of food and harborage. The next step would be rat-proofing all possible means of entry, followed by trapping. Indoor use of poisons is not recommended except in the hands of an exterminating expert. Caution must be used in handling trapped rats as they are frequently infested with parasites seeking a new host. In one automobile plant where workers complained of an itch, minute rat mites, identified under a microscope, were found to be the cause. Further investigation indicated that they were transmitted on folding cartons among which rats had been nesting. DDT successfully combated the mites after the rat problem was eliminated.

Most insecticides are toxic to humans as well as insects. Powdered insecticides should be tinted with unmistakable coloring so that nobody will confuse them with sugar, salt, pepper, or other condiments and foodstuffs. Persons applying insecticides with spray guns should protect themselves with respirators suitable for the purpose. Rooms sprayed with insecticides that have volatile components should be thoroughly aired before being re-occupied.

Summary

Plant sanitation, in short, is concerned with providing working conditions which are conducive to the well-being, comfort, and efficiency of workers. The statement made for air sanitation holds true for all plant exposures; viz., conditions must be sufficiently well controlled that they do not predispose to illness of workers. Even though dirt may not necessarily cause disease, its presence is, nevertheless, esthetically objectionable. However innocuous contaminants may appear to be, their control is conducive to good employer-employee relationships in addition to other economic advantages.

The Safety Engineer's interest in the plant sanitation program is not without justification since he is concerned with any plant condition that tends to impair the ability of workers to perform their normal assignments. The industrial hygienist is prepared to assist in obtaining much of the information needed for the sanitation program.

Based on a lecture delivered at the University of Michigan School of Public Health In-Service Training Course in Industrial Hygiene & Human Relations for Safety Personnel on June 19, 1950.

Hygiene Executive Dies

(Continued from page 53) at that time were bending every effort to convince industry of the importance of industrial hygiene. Largely through his work, the Foundation has grown to the point where it now encompasses more than 200 companies in a large variety of industries. It has attracted an able and widely respected staff which is engaged in fundamental research on many problems of industrial health—notably those of air pollution, dusts, and silicosis. It has conducted

surveys in scores of plants throughout the world. Its annual meetings held at Mellon Institute have become the rallying point for men of management and science in their struggle against industrial disease.

After a four-year stint with the AP, Mr. McMahon joined the Industrial Hygiene group at Mellon Institute to attend to public relations. Six years later he succeeded the late Dr. H. B. Meller as Managing Director of the Foundation. His many forceful articles on industrial health have induced the serious attention of industrialists, scientists, publishers, educators, underwriters and personnel specialists. He was indeed a highly productive leader in the realms of occupational humanics and industrial hygiene.

Air Pollution & Smoke Prevention

RECENTLY, the Smoke Prevention Association of America was reorganized under the new name of the Air Pollution and Smoke Prevention Association of America. It is a voluntary, cooperative, non-profit organization. The purpose of the Association is to foster the control of atmospheric pollution and improve air sanitation by promoting the following objectives:

1. The abatement of air pollution which affects health, causes property damage, is a nuisance to the public, or wastes natural resources.
2. Encourage public acceptance and assist government units in solving the problem.
3. Encourage the development of equipment and procedures that will economically prevent air pollution.
4. Encourage the support of technical, civic, governmental, medical, health, and other organizations interested in the problem.
5. Encourage industrial and distributing firms and associations to cooperate in experimentation and application of methods of reducing air pollution.
6. Encourage the development and adoption of workable, reasonable engineering standards on a national and international scale.
7. Promote research on problems embracing all sources of air pollution.
8. Aid cities and public bodies in adopting regulations to control the discharge of harmful contaminants into the air.
9. Prepare and distribute literature on the subject of air pollution.
10. Maintain a library and information service on the cause, effect and remedy of air pollution.

Pending the appointment of a permanent Executive Secretary, the Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio has agreed to act as a headquarters unit for the Association, with Dr. Hamnett P. Munger as Executive Assistant.

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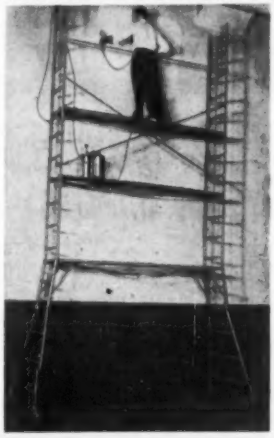

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The Case of the Drowsy Pattern Makers

SOMETHING strange was happening in a certain foundry. As related in *The Industrial Hygiene Newsletter*, the owner of the foundry, in seeking help with his problem, described the phenomenon as a mysterious sleeping gas which was making his pattern makers drowsy and causing headaches.

Adjacent to the pattern shop and separated from it by a partition, which did not come to the ceiling, was the aluminum castings department.

Aluminum was melted in a gas-fired furnace. Air was furnished to the furnace by means of a blower originally intended for a pipe organ.

Tests for carbon monoxide showed values far above the maximum allowable concentration. It was found that the blower could not supply sufficient air to burn completely all of the gas normally entering the furnace.

Installation of a blower large enough to insure complete combustion reduced the carbon monoxide concentrations to a point not considered to be harmful. As a result of this correction, the pattern makers have experienced no further periods of unusual drowsiness or headache.

THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

Longevity of Industrial Population

THE American scene is actually conducive to long life and a satisfactory health record. With our preoccupation with injuries and diseases, with nursing and medical care, some are apt to lose sight of the great achievements that have become amply evident in a measureable way. We are facing the problem of the older workers because so many now live and are in comparatively good health at 65 years of age or over. Our rates for cancer and heart diseases are rising for the same reason. A writer in an English medical journal recently pointed out that the incidence of cancer was comparatively very low among the colored population of Africa. The reason, of course, is that so few of them attain an age of 50 and over. Data of a large insurance company reveal that in 1949 the expectation of life at birth among millions of industrial policy holders had reached a new high of 67.7 years. This represents a gain of fully five years over the figure for 1939. Incidentally, the improvement of mortality and longevity rates during the past four decades has been greater in the industrial population than in the population as a whole. This may be accounted for by the improved housing of the working population, better nutrition, increased wages, shorter working hours, control of hazardous conditions in work places, advances in preventive medicine, improvement in the safety and quality of milk and other food supplies, and a number of other contributing causes. The immediate past looks encouraging. By keeping up the prevention work in industry, a real contribution can be made to the future health and longevity of the American working population.

Old Age Benefits

ON AUGUST 28th, President Truman issued a message indicating his approval of the House of Representatives Bill No. 6000, which amended the Social Security Act extending old age benefits. About 10,000,000 additional men and women will come under the benefit provisions of this new law in January 1, 1951. The old age insurance tax will remain at the current rate of 1½ per cent for employers and a similar tax for workers until January 1, 1951. However, the part of the workers' salary that will be taxed will rise from the present top of $3,000 to $3,600 a year. This will bring the maximum tax, at current rates, to $54 a year each for employers and workers, as against $45 under the old law. The maximum monthly payment to a family will be $150, or 80 per cent of the worker's average monthly wage, whichever is less. The family of a worker who dies will get a lump-sum payment equal to three times his monthly insurance benefit. This will be in addition to any monthly benefits to which the survivors might be entitled. Many workers who could not qualify for benefits under the old act have become eligible for immediate payments as a result of the changes. These are men and women past 65 who had not worked steadily enough to meet the qualification standards that have prevailed since 1937. Industrial nurses might well make themselves familiar with these and other major provisions of this new legislation. It directly affects employees and employers alike, and in some instances at least, will have a direct bearing on the activities of industrial medical and nursing services. What these are may become clear from a study of the new law.

What Causes Hives?

URTICARIA or hives (nettle rash) is an inflammation of the skin or mucous membrane due to allergy, as a rule, and characterized by whitish, pink or red elevations known as wheals. These are accompanied by severe itching or burning. Essential causes relate to the influence upon allergic individuals of various substances (allergens) either produced within the body or introduced from without. Certain foods, drugs, bacterial toxins, and serum, as well as other

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substances may be the causative factors. A worker with an attack of hives cannot, as a rule, carry on his usual work. In a recent issue of the Journal of the A. M. A., there is an article dealing with this subject, but the emphasis is not on physical causes. Rather it is reported that there is a close relationship between and attitude of resentment and the development of hives. In a study of patients with long-standing cases of hives, it was found that they were not allergic to the usual and indicated factors. Rather, the attacks of hives were highly correlated with emotional disturbances of a particular kind. Traumatic life situations responsible for the lesions were almost exclusively those in which the patient felt resentment because he saw himself as the victim of unjust treatment about which he could do nothing. Those patients considered themselves wronged and injured, usually by someone in a fairly close family relationship, and they regarded the situation as one about which they could do nothing. Not being able to retaliate or run away, they become intensely resentful. An attack of the hives followed. Psychologic factors are being given increased attention in the area of physical disease. This is essential if we are to gain a better understanding of why some act as they do.

State and Federal Legislation

THE U. S. Bureau of Labor Standards has again published an annual digest of state and federal labor legislation ending December 31, 1949. This is Bulletin Number 118, and is available through the Government Printing Office. The major headings cover the following items: child labor and school attendance, industrial relations, safety and health, unemployment insurance, wages and hours, and workmen's compensation. Several states enacted legislation to increase the safety of workers. The Oklahoma factory act was amended to broaden the duties of the factory safety inspector and to increase the type and number of establishments coming within the coverage of the act. A Michigan act authorized state factory inspectors to order the installation of first-aid facilities and specific ventilation where necessary. A South Carolina law requires that emergency exits be maintained in textile mills. Vermont created a division of Industrial Hygiene with authority to study and investigate conditions causing occupational diseases and to recommend regulations for control of such diseases. In West Virginia, the Board of Health was authorized to make reasonable rules and regulations to control occupational and industrial health hazards and to regulate sanitary conditions in workshops, factories, and labor camps. The Industrial Commission of Wisconsin was authorized to require suitable lunchrooms in places of employment if such lunch-

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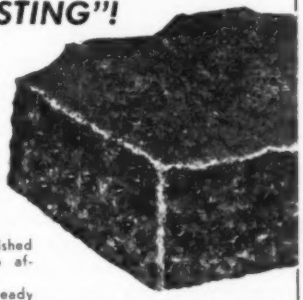

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rooms are found necessary for the welfare of the employees. California enacted a law prohibiting the discharge of an employee for refusing to perform work in violation of a safety order of the Division of Industrial Safety. This 140-page publication can be of value to many administrators of health, welfare, and personal services in industry.

Hand Injuries

INJURIES that mount up statistically relate largely to man's major tools, namely his hands. In a series of articles on this subject published in a medical journal, emphasis is placed on the protection of the hands. The first aid care of wounds of the hand should be directed fundamentally at protection. This should provide freedom from infection, from added injury and subsequent disability and deformity. The best first aid management consists in the application of a sterile protective dressing, a firm compression bandage, and immobilization by splinting in the position of function. An attempt should be made, according to the publications mentioned, to examine, cleanse, or treat the wound of a hand until operating room facilities are available. In compound fractures the purposes of early treatment are relief of pain and shock, arrest of hemorrhage, protection against infection and further injury, removal of foreign bodies and dead tissue, conservation and restoration of damaged structures, early healing and restoration of function. These recommendations were prepared by the Committee on Fractures and Other Traumas of the American College of Surgeons. While they are not intended to apply to the activities of industrial nurses, it is desirable for them to realize how much care must be exercised and what steps are essential in hand injuries. In some plants, such nurses attempt to do too much, especially when the services of a full-time physician are not available. Industrial nurses must recognize where their responsibilities end and when injured workers must be referred to affiliated physicians or medical institutions. The injured workers will be best served if these precautions are followed.

Major Cause of Absenteeism

WITH the coming of cold weather, the rate of absenteeism tends to rise. A major cause can undoubtedly be placed on the marked incidence of colds and related respiratory conditions. Much has been written about colds, many efforts to prevent, abort, and treat colds have been made, but reliable medical reports seem to indicate that thus far no progress has been achieved. The standard procedures still prevail. An internist, writing on some problems presented by the common cold summarizes his comments by noting that the common cold is a specific virus infection which may be thwarted by resistance of the host or promoted under some conditions by exposure to cold or by other influences. Infection may come from without, from a patient or from a carrier, and carriers probably may catch cold from autoinfection. There is no solid evidence that the true cold is influenced by antihistaminics or antibiotics, nor is there any reliable method of prevention. Treatment remains symptomatic—rest, safe-guarding, local applications, and general sedatives. The true cold is often confused with the various forms of traumatic rhinitis, which are not the common cold at all and which may be amenable to various forms of suitable treatment, such as antihistaminic or antibiotic therapy. Secondary complications caused by ordinary bacteria are likely to occur during the course of the common cold. These are to be helped by the use of antibiotics. Studies on the use of antibiotics as well as antihistaminics are continuing in different parts of the country. Naturally, the well-informed industrial nurse will not dispense these medications without definite instructions from the physician in charge. Some industrial nurses have a tendency to try experiments on their own. Serious consequences may sometimes follow.

Free Bulletins & Catalogs
See page 69

What's New...

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DECONTAMINATION LIQUID

A NEW solution for the cleaning of surfaces contaminated by radioactivity has been developed by The Atomlab, Division of the Atomic Center, New York. Called "radiacwash", the product performs six different actions which contribute to removing radioactive contaminants from exposed surfaces by combining the best available physical and chemical principles of decontamination. The liquid acts as a combination detergent, emulsifier, solvent, ion-extractor, surface wetter and carrier. It does not neutralize radioactivity, or the physiological effects of radiation, but assists in lifting up contamination prior to penetration. For details, send in the coupon.

ACID HANDLING CONTAINERS

THE AMERICAN AGILE CORP. of Ohio has announced a new line of plastic polyethylene bottles and safety jugs for the safe transportation and storing of strong acids. The bottles are made in pint, quart, half gallon, and up to three gallon sizes. These safety jugs are filled through the pouring spout to a level which prevents accidental spillage. The bottles, jugs and buckets are made of seamless polyethylene tubing with welded bottom, cover and spout. They are leakproof, light in weight and practically indestructible when compared with containers made of non-corrosive types of metals. According to the company, lengthy research into the theory of plastic welding has resulted in a process that will considerably help to overcome certain problems which continually face the chemical industry. For details, send in the coupon.

COMBUSTIBLE GAS DETECTOR

LISTING of the Davis Vapotester by the Underwriters' Laboratories has been announced by the Davis Emergency Equipment Co., Inc. of New Jersey. The Vaportester, also approved by the Factory Mutual Laboratories, is a Davis engineered instrument for the detection of combustible gases and vapors.

Operating on the principle of the Wheatstone Bridge Circuit, the Vapotester reads zero gas or vapor to the lower explosive limit. It is widely used in refineries, chemical plants, natural or manufactured gas plants, gas or oil pumping stations, transmission lines, etc. for the determination of hazardous gas or vapor conditions and the source of leaks. For details about the instrument, send in the coupon.

CHEMICAL FIRE RETARDANT

A NEW fire retardant, called FLAMORT, has been developed by the FLAMORT Chemical Company of California. This fire preventive is made with patented dry chemicals and mixed with water. It is then sprayed on unpainted wood, fabrics, paper or other combustible materials to make them flame-resistant. The heat of the fire liberates non-irritating, non-toxic gases which dilute and cool the products of combustion to below their spontaneous ignition point. At the same time a glaze and char-like coating forms at the area contacted by the flame. Due to this double action and nature of Flamort Fire Retardants the tendency to smoulder is eliminated. No lighted cigarette or match will ignite on materials treated with Flamort. In cases of flames or heat in excess of 1000 degrees F., untreated material will rapidly burst into flames and be consumed, but "Flamortized" articles will be charred only at the point of attack of the flame and no blaze will appear at all. Wood surfaces will, under prolonged exposure to a blow torch, char to a depth deeper than the 3/16 inch penetration of the spray, but they will not burst into flame or carry an after-glow.

Water-soluble wood stains or dyes may be added to the Flamort solution. Most good rug shampoos and tints can be combined with Flamort for textiles so that a combination of treatments can be accomplished in one operation. Flamort Protextile is a combination of flame and mothproofing for textiles so that fabrics can be flame and moth-proofed at the same time. One gallon solution will treat 100 to 200 square feet of textiles, three coats will treat 110 square feet of lumber, or 60 square feet of cellulose board. For further details, use the coupon.

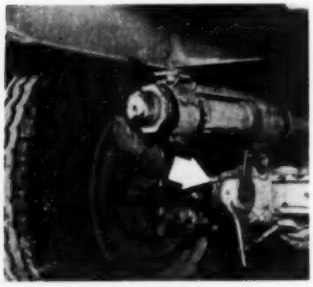
ACID MASK

A NEW protective mask for use when repairing acid line breaks and on other jobs and operations where complete face, head and neck coverage is required, has been developed by the Industrial Products Company of Pennsylvania. This new mask is known as the No. 7V Nitrometer-Acid Mask. It is manufactured with an aluminum frame to which is attached an electronically sealed hood and cape of clear, frosted Vinylite. Light weight and flexible, it allows freedom of movement and comfort. It extends well down over the shoulders and is made full so that the mask may be turned up over the head when the wearer is not exposed to the hazard. The mask is fitted with a new type of headgear that adjusts comfortably to all head sizes. The window is of heavy gauge plastic (.060" thick) for impact resistance. For further details, use the coupon.

TRUCK BRAKE ADJUSTER

A NEW device that makes the stopping of trucks, trailers and buses surer and safer by automatically taking up the slack due to lining wear in cam-actuated air brakes is offered by the Brakemaster Corp. of Illinois. This device periodically advances the brake shoe to compensate for wear, thereby keeping the brake shoe close to the drum in the proper position for fast braking action. One unit is required for each brake assembly. Among the advantages claimed for the Brakemaster are lower maintenance costs, less tire wear, longer life for linings and brake drums, elimination of sway during brake applications.

The Brakemaster is mounted on the splined camshaft of cam-actuated air



brakes. The power arm is connected to the push rod from the air brake diaphragm, and the anchor arm is mounted to a convenient point on the brake assembly. The power arm engages ratchet gears in the Brakemaster, and as the lining wears, the power arm gear slips from tooth to tooth of the ratchet, advancing the brake camshaft. A dial on the device indicates the extent of brake lining wear. The unit fits all standard brake assembly lineages. The only maintenance required is greasing when the chassis is lubricated. For details, send in the coupon.

ODOR-LESS ENAMEL

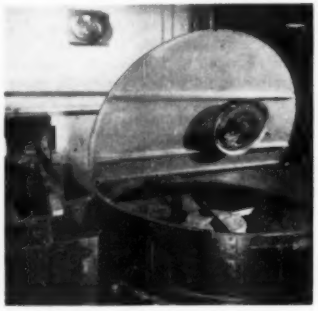
THE Wilbur & Williams Co. of Mass., originators of DAMPCOAT enamel used for many years in leading dairies, food plants and industries where damp surfaces prevail, has developed a new ODOR-LESS DAMPCOAT ENAMEL. This product enables painting to be done even in the presence of food with no danger of food tainting. It is supplied in white, dries dust-free in three hours, can be brushed or sprayed, goes over damp or dry surfaces, painted or unpainted, and is even safe to use on fresh plaster walls with no undercoater. Ink, pencil marks, lipstick, wax crayons and many other stains can be easily washed off. The paint is resistant to gasoline, carbon tetrachloride, and lime in plaster. It is recommended for food plants, hospitals, homes and wherever odor cannot be tolerated. For complete details, use the coupon.

RIBBED SAFETY HAT

HIGH impact resistance is built into a new 12-ounce aircraft-grade aluminum alloy Hard Boiled safety hat, made by the E. D. Bullard Company of California. The distinctive ribbed design furnishes ample structural strength while the crown remains resilient to absorb as much of the impact of a falling object as possible. This safety hat incorporates a second impact-absorbing feature. The inner hat assembly is designed to absorb shock with its full-floating, six-point, suspension hammock. Headbands and hammocks are fully adjustable to fit all head shapes and sizes. The entire assembly can be replaced without tools with slide-action wedge-type fasteners. The crown is natural aluminum color, with a non-glare finish. For further details, use the coupon.

AUTOMATIC FIRE ALARM

THE fire alarm installation shown in the accompanying picture is typical of the progress made by companies seeking more adequate fire protection. These new automatic alarms are being used throughout the plant in places where fire hazards exist. Made by the Buffalo Fire Appliance Corp., the alarms are completely automatic, independent, self-contained units. No electricity, complicated installation or maintenance is required. The rust-proof, wind-up mechanism is released automatically by a heat-sensitive fuse. A loud, penetrating, five-minute warning is



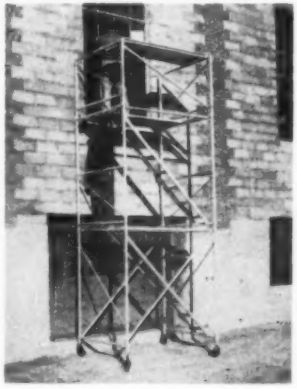
sounded when the temperature reaches 135 degrees. Other heat limits are available.

Because the alarms give warning when fires first break out, the necessary measures can be taken to prevent a disaster: the fire department can be summoned immediately; the fire can be quickly extinguished with an on-the-spot extinguisher; all occupants can leave the building; and fire doors can be closed.

The alarms are easy to install either on walls or ceilings. No electrical wiring is necessary. After the alarm has automatically sounded, it can be rewound, the fuse replaced, and it is ready again to warn the instant fire threatens. For further details, send in the coupon.

ALUMINUM MAINTENANCE SCAFFOLDS

GOOD scaffolding plays its important role in plant maintenance no less than in plant construction, for such overhead and sidewall jobs as painting, cleaning, repairing and remodeling. The Patent Scaffolding Co., Inc., of New York, is



marketing a sectional aluminum rolling scaffold that is light, easy-to-handle, and corrosion-resistant. At the same time it has the necessary strength, sturdiness and rigidity as a result of effective bracing.

The scaffold is easily assembled or disassembled, and occupies little space for storage or transportation. The interchangeable parts make it possible to erect as many sections as the job requires. It is available in two types: with ladder built into the frame, or with stairway attached to the frame. Casters are adjustable for height and are equipped with ball bearings and brakes. Base dimensions are 4' by 6'. The bottom section is 7'5" from the ground to the first platform. Additional sections are 6'8" high.

Because the scaffolds are narrow, they can be rolled through doorways and between obstructions. Ladder sections are available in three heights. For further details, use the coupon.

LEAD GLASS UNIFORM

LONG term studies have shown that occurrence of leukemia is eight times greater among radiologists than among physicians in general. The answer may lie in scattered radiation, as met during fluoroscopy. The majority of radiologists wear only lead rubber aprons and reason suggests that exposure of arms, shoulders, and lower legs to scattered radiation, over a period of time, may result in a leukemic condition among those with a delicately balanced hemopoietic system.

Endeavoring to overcome this situation and devise a garment that would afford ample protection to the body, Dr. Vin-

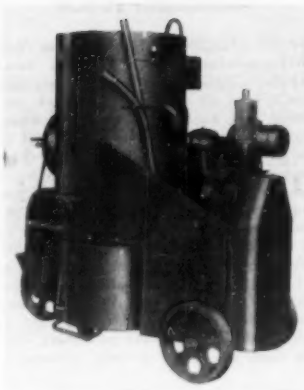
cent W. Archer of the Department of Roentgenology, University of Virginia Hospital, and associates, conceived the idea of spun lead glass woven into a fabric for protection against x-ray and beta radiation.

Today, that idea has become a reality and Bar-Ray Products, Inc., the exclusive licencee for the fabrication and distribution of this lead glass material, produce a gown that is lighter in weight than the ordinary heavy type lead rubber apron, and which gives the body protection where it is needed. For further information, use the coupon.

NON-ELECTRIC VACUUM CLEANER

"CLEANS wherever it goes"—independent of electric service—is the advantage claimed for a new gasoline-engine powered vacuum cleaner announced by the Air Appliance Division of the U. S. Hoffman Machinery Corporation of New York. The new portable cleaner is designed to provide the efficiency and economy of industrial vacuum cleaning for those applications where the cost of electric wiring would be excessive, for cleaning outdoor areas, or for large plants requiring cleaning in widely scattered locations.

Designated as the Hoffco-Vac #50 for gasoline operation, the new unit is pow-



ered by a 4-cycle, single cylinder, air cooled engine rated at 6.8 H.P. It is equipped with a flame-arrestor type muffler. V-belt drive connects with a multi-stage centrifugal exhauster. In all other construction and operation features, Hoffman's new gasoline-powered vacuum cleaner is exactly the same as the company's electrically operated Hoffco-Vac #50, just recently re-designed and improved. Two-sweeper cleaning is provided with 7½ cu. ft. dust container capacity and simultaneous operation of two 50-foot lines of 1½-inch hose. For single sweeper use, one 75 or 100-foot length of 2-inch hose can be operated with the Hoffco-Vac #50.

Dimensions on the new unit are: length, 74 inches; width, 39 inches; height, 74 inches. Three 16-inch rubber-tired roller bearing wheels facilitate handling by one man. One swivel wheel permits the machine to be turned in its own length.

Completely equipped with a box for cleaning tools, a compartment for floor and wall rods and a rack for hose, the Hoffco-Vac #50 is designed to provide a high degree of "non-stop" cleaning. For details, use the convenient coupon.

NEW DEMAND MASK

IN CONFINED places, where respiratory emergencies are created by high gas concentration or oxygen deficiencies, protection is offered in the M. S. A. Demand Mask, made by the Mine Safety Appliances Company of Pennsylvania. This mask combines a supply of oxygen with a demand regulator and All-Vision facepiece to provide the wearer with a simple, lightweight, easy to use safeguard for breathing under the worst respiratory conditions. Approved by the U. S. Bureau of Mines for a minimum of 30 minutes' service under hard physical exertion, the M. S. A. Demand Mask supplies air to the wearer in exact accordance with his breathing needs or varying lung demands. The mask is well balanced and comfortable to wear with light metal frames and padded leather harnesses. It weighs only 32 pounds complete.

In the unlikely event of failure of the automatic demand mechanism, a by-pass valve can be opened to permit a controlled flow from the cylinder around the demand regulator; excessive flow or pressure is prevented by an orifice of restricted size. For further details, use the coupon.

CYCLONE DUST COLLECTORS

TWO new models to their line of Cyclone Type Duskolectors have been announced by Hammond Machinery Builders, Inc. of Kalamazoo. Model CYO-6, as shown, is recommended for installations for exhausting air to the outside. Model CYB-6, not shown, is of the same construction but is fitted with a dust proof bag, and is adaptable where conditions permit recirculating the air. Their larger dust capacity, and 2 HP motor provide a heavier duty dust collecting system for dust, grit, lint, sawdust, plastics, buffing compounds, etc.

Capacity of both models is 1150 CFM velocity 5690 FPM with 2 HP motor. Base is 26" in diameter and dust pan capacity is 10,620 cu. inches. Overall height is 86", inlet size is 6" and outlet size is 7". For descriptive bulletin and complete details, send in the coupon.

CORK BULLETIN BOARD

THE Industrial Products Company of Pennsylvania has announced a new bulletin board, moderately priced for general use. It is made of a specially fabricated cork-faced material with a hardwood frame. The cork face is in natural tan color and the frame is satin-finish stained to harmonize. The top panel carries the word "BULLETINS" in brown letters.

The over-all size of the Ipco Cork Faced Bulletin Board is 27" x 40", with an open area for bulletins, notices or posters of 23" x 30". The top panel can be eliminated if desired. The unit is adapted for plant and office use, institutions, schools, hospitals, commercial establishments, etc. For further information, use the convenient coupon.

November, 1950

To Safety Maintenance & Production

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ Decontamination Liquid
- ☐ Acid Handling Containers
- ☐ Combustible Gas Detector
- ☐ Chemical Fire Retardant
- ☐ Acid Mask
- ☐ Truck Brake Adjuster
- ☐ Odor-Less Enamel
- ☐ Ribbed Safety Hat
- ☐ Automatic Fire Alarm
- ☐ Aluminum Maintenance Scaffolds
- ☐ Lead Glass Uniform
- ☐ Non-Electric Vacuum Cleaner
- ☐ New Demand Mask
- ☐ Cyclone Dust Collectors
- ☐ Cork Bulletin Board
- ☐ Flameless Torch
- ☐ Water Purifier
- ☐ 3-in-1 Facepiece

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

FLAMELESS TORCH

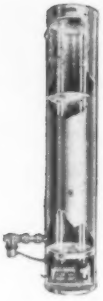
INTRODUCING its new heavy duty Thermal-Jet Flameless Electric Torch which "supplies all of the heat necessary for 95% of all ordinary flame torch purposes," the Kinetic Corporation of Pennsylvania announced full production of its latest model Heat Gun for professional and amateur use. The new model has a one piece aluminum jacket with 3" orifice, a high-speed heavy-duty replaceable electric unit, and a pistol grip handle with an 8 foot U. L. approved heavy duty cable. The gun can be used with 115V A. C. or D. C. current. Total weight is approximately two (2) pounds. This gun is used like a blow torch but does not burn or scorch the surface, thus permitting it to be used on canvas covered surfaces as well as on metal or wood.

A wide variety of high-heat uses are claimed for Thermal-Jet Heat Guns and the manufacturer states that in addition to removing paint, varnish and enamel, they are now in use for cementing, refinishing, melting, shaping and spot heating purposes. For further details, use the coupon.

WATER PURIFIER

AN entirely automatic, electrically-operated ultra-violet water sterilizer now solves the problem of supplying pure drinking water, where water must be obtained from a well, spring or other unprotected source. Known as the Sepco Ultra-Violet Water Sterilizer, made by the Sepco Corporation of Pennsylvania, this unique device meets public health standards. It requires no attention, uses no chemicals and adds no taste or odor to the water. Purification is done by powerful ultra-violet radiation and effectively destroys all bacteria in even the most badly contaminated water.

The sterilizer consists of a stainless steel tank 71" high by 12" in diameter. Inside are four specially-constructed ultra-violet ray tubes extending vertically through the water. Patented baffles at various levels guide the incoming water close to the constantly glowing tubes, thus assuring 100% purification. This device purifies water at the rate of 400 gallons an hour, more than the average home will use in an entire day. Where a larger supply of water may be needed, two or more sterilizers can be installed. It is only necessary to connect the sterilizer into the incoming water line ahead of any taps, then plug it into a standard electrical outlet. For further details, use the coupon.



3-IN-1 FACE PIECE

AN ENTIRELY new approved gas mask face piece which provides chin-style, chest-style and hose-mask connections in one unit and retains all the full-vision advantages of their other types has just been announced by Acme Protection Equipment Company, Chicago.

According to the announcement, the new face piece, known as No. 6, provides the way to use the same mask for three different services, thus eliminating the need for a different face piece for each service. It will include the regular Acme features of full-vision and dead-air check valve and will introduce among other innovations, a new type inhalation-exhalation valve for minimum breathing resistance and the 3-in-1 feature to enable use of chin canister, chest canister and hose connections on the same mask.

It is reported that the new approved Acme No. 6 face piece will replace the Acme No. 4 and No. 5 face pieces which were limited to hose and chin canister connections respectively. For further details, use the coupon.

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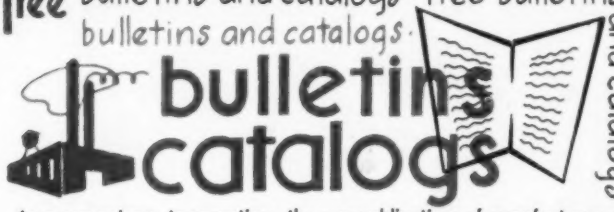

As a convenience to executives, the new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. The catalogs, data sheets and technical bulletins reviewed here present the lastest information on protective and maintenence products and equipment.

EDUCATIONAL AIDS

Supervisor's Manual 1
Marsh & McLennan, Inc. A 16-page booklet, "Safety As It Applies to Supervisors," printed for the purpose of assisting supervisors in the prevention of industrial accidents. It discusses the supervisor's responsibilities, the importance of his knowing the causes of accidents in order to prevent them, corrective action, and the most effective way to get cooperation.

Steel Signs for Safety 2
Stonehouse Signs, Inc. A 4-page bulletin exhibiting colors, sizes, prices and types of signs for industrial guidance, information and warning purposes.

Label Pipe Markers 3
W. H. Brady Co. A bulletin describing QUIK-LABEL Pipe Markers to serve both in operations and in training new men. Further information is given about the marker's color identification, readable printing, ease of application, and resistance to water, weather, and dirt.

Service Awards for Safety 4
American Emblem Co., Inc. A new bulletin in which is reproduced in full color a wide variety of pin and button awards. The booklet was designed to reveal to employers the various types and designs now part of the loyalty building programs of some of the leading industrial, business and institutional organizations in the United States.

FIRE PROTECTION

Automatic Sprinkler 5
Automatic Sprinkler Corp. of America. A 1-page bulletin describing "Fire Fog" for fire control and extinguishment. The bulletin describes the blanketing, isolating and quenching action of this system, and making safe those areas vulnerable to fire.

Air Foam 6
Pyrene Manufacturing Co. A new brochure explaining air foam, methods of application, high and low types of foam compound, specifications and operating characteristics for five sizes of portable play pipes, mobile and stationary foam proportioning tanks and installations of the auto induction, pressure line inductor, and self-contained and motor apparatus types. A selector valve for use with wetting agent and foam compound carried on motor fire apparatus is also shown.

Booklet on Fire Control 7
Ansul Chemical Co. A 4-page bulletin describing the nature of fire, the instances when fuel should be removed, the use of water to absorb heat, the methods of exclusion of oxygen from a fire, classification of fires, characteristics of flammable liquids, and the control and extinguishment of gasoline fires.

WALKWAY SAFETY

Steel Floor Covering 8
Inland Steel Co. A pamphlet giving 20 selling points of their steel flooring material, highlighting the ease with which it can be shaped and fitted to any floor, the simplicity of cleaning, its durability and strength, and its resistance to water, chemicals and fire.

BUILDING MAINTENANCE

Flameproof Bonding Material 9
Schwartz Chemical Co., Inc. A bulletin describing the uses, properties and advantages of Rez-N-Bond, a non-flammable bonding agent for cementing acrylics of polystyrene. It points out the simplicity of shipment and storage, the rapidity of setting, and the durable strength of the cement.

Rubber Putty 10
B. F. Goodrich Co. A new catalog section on "Plastikon," a rubber base putty material used for glazing and sealing, particularly suitable where vibration, corrosion or moisture exists. The section cites the advantages of the product, gives directions for use, and lists stock colors and grades.

Equipment Maintenance 11
Haveg Corporation. A new 64-page source of detailed information designed to assist in the prevention of corrosion and the reduction of repairs and replacements of pipes, valves, pumps, tanks, etc. Over 300 sketches, photos and tables explaining the different types of available process equipment, their specifications and installation.

Rust Proof Metalic Coating 12
Republic Powdered Metals. A bulletin describing a metallic coating used for rust proofing and brightness in plants. It discusses the product's durability, economy, adherence and ease of application.

MATERIALS HANDLING

Safety Fuel Tanks 13
American Safety Tank Co. A 4-page pamphlet highlighting the new improvements made in safer gasoline tanks for motor vehicles. It explains the crash-resistance of the tank, its spill-proof feature, and its maximum resistance to rupture pressure in case of fire, thus removing the danger of explosion.

Foundry Hooks 14
American Chain & Cable, Inc. A bulletin page describing the safety of Acco Foundry Hooks. It also mentions the fact that chains come assembled with the hooks, thus reducing chain costs, and that it replaced the home-made hook, lifts unbalanced loads, and removes the need of spiking.

TOOLS

Air Painting Equipment 15
Paasche Airbrush Co. A 40-page catalog showing the types, sizes, and prices of air painting and lacquering tools. Also shown are the vast number of nozzles, needles, sprayers, flock units, cup assemblies, pressure tanks, ventilation units and accessories, which are manufactured by this company.

PERSONAL PROTECTION

New Lens Cleaner 16
Wilkins Co., Inc. A 4-page bulletin giving details on a new product, FOG FREE, which is a mobile liquid that creates an invisible coating on optical surfaces to render them free of fog or steam for hours. Also described are K-LENS-M CLEANER & TISSUES which clean glasses and goggles quickly, efficiently and economically.

Safe Rubber Footwear 17
Beacon Falls Rubber Footwear. A 3-page booklet giving types, sizes, prices, designs and colors of rubber foot protection equipment, featuring "Top Notch," a waterproof boot with safety toe cap able to withstand 2000 pounds of pressure.

Dust Arrester 18
American Air Filter Co., Inc. A 7-page dust control bulletin describing AIRMAT Dust Arrester in terms of new improvements, types and sizes. It shows by pictures and drawings how and of what material this device is constructed.

Dust Filter 19
Ruemelin Manufacturing Co. An 11-page bulletin covering the entire subject of tubular type cloth dust filters, both in single compartment and automatic continuous multi-compartment units as used by various types of industry. It lists advantages, details of construction, and capacity chart.

Farm Spray Respirator 20
Mine Safety Appliances Co. A new bulletin covering a protective breathing apparatus for outdoor application of Parathion. Called M-S-A-Farm Spray Respirator, it is described as lightweight, snug fitting, with 2 chemical cartridges, equipped with special filters for protection against light concentrations of organic vapors, and a molded rubber facepiece which is gastight and comfortable.

LADDERS AND SCAFFOLDS

Safer Ladder Construction 21
Louisville Metal Products Co. A bulletin showing the improvements made in aluminum ladders by strengthening of vital areas of stress. The construction of safer stress areas is described in 6 illustrated steps.

Ladder-Stair Combination 22
R. W. Fieroh Co., Inc. A bulletin describing the various models of the "Handy-Jack Stair Stand" for safer climbing. It points out the ease and safety with which things may be reached, the lightness and strength of construction, and gives a list of weights and sizes of the illustrated models.

Aluminum Scaffolds 23
The Patent Scaffolding Co., Inc. A new booklet on Aluminum Sectional Rolling Scaffolds including pictures and photographs of scaffolds in actual use, with specifications, complete descriptions of the pre-fabricated construction and uses of this type. Lightness, ease of erection, neatness, durability and adaptibility are among the advantages featured, also ease of dismantling and storing and availability of parts.

WRITE NUMBERS CORRESPONDING TO THE ITEMS HERE ☞

Your Company Name _____
(Please Print)

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Street _____

City & State _____

Your Name _____

Your Title _____

Return This Coupon To:

SAFETY MAINTENANCE & PRODUCTION
75 Fulton Street
New York 7, N. Y.

November, 1950

LEARNING THE

ASPHALT COATINGS ARE FIRE FUEL

THREE buildings caught on fire during December, March, and May, resulting in losses amounting to over a million and a half dollars. The metal parts of these ruined buildings were coated in asphalt, causing very heavy losses. New coated metal materials with greater fire-resistant capacity have been developed for construction of this type, but a large amount of the older type construction is in service. In these fires, unusual difficulties in controlling the blazes are encountered. When high enough temperatures have developed, the fire spreads rapidly along the asphalt coated surfaces, usually in areas where it is difficult to reach. In addition, burning and melted asphalt dripping from the roof spreads fire in combustibles and makes fire fighting inside the building hazardous. Where older types of asphalt coated metal are still in use, automatic sprinklers or replacement with safer types of roofing and siding are generally needed, as best determined by a study of each case.

HOME-TYPE SURGERY BREAKS TWO TEETH

BY AN odd combination of circumstances, one accident led to a second accident in a garment cleaning plant in the Middle West. A worker attempted to remove a needle from a co-employee's hand, no doctor being immediately available and the pain to the accident victim being great. To extract it, she took the end of the needle between her teeth, but in so doing, broke two front teeth and suffered lacerations in her mouth. While home-type surgery may have been warranted under the circumstances, it would seem that some sort of first aid should have been provided for such an emergency in a plant where such accidents as needle punctures are not uncommon. In this particular case, even a pair of pliers would have been more effective than a fellow employee's teeth.

A LONG HAIR ACCIDENT

IN THE mechanics' shop of a large factory a young man was working with a small sensitive drilling machine. His hair was caught between the belt and the pulley on the spindle and his head was dragged up against the pulley. He was cut above the eye. The machine has now been fitted with a guard, but the ironical point of this accident is that the man was making guards for machinery in the factory, including the machine he was using.

LIGHTNING STRIKES PIPE LINE IN STORM

A GROUP of six men, breaking out a 4-inch line pipe, came to a deep gulley where the next joint had been bent to make a crossing. As four of the men raised the pipe to place it on the jack, lightning hit the line, knocking them all down. A fifth man, holding onto the jack, was unable to let go, but like the others, escaped injury. When attending jobs of this nature, the elements should be given careful consideration.

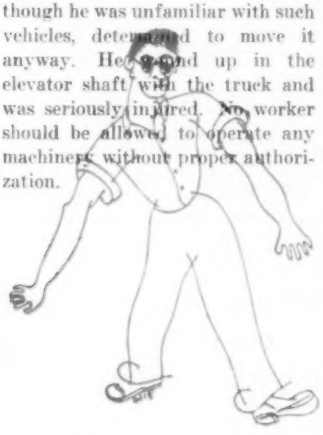
HARD WAY

IGNITED VAPORS START FIRE

AT a Midwest plant, employees heard a roaring noise and found that vapors of cutting oil from automatic screw machines had ignited in the exhaust ducts, possibly from a lighted cigarette drawn into the system. They sounded an alarm, shut down the blower, and successfully extinguished the fire with foam and carbon dioxide, but not before considerable damage was done. Orders have now been placed for fixed manually operated carbon dioxide systems on each exhaust unit.

AMATEUR DRIVER CAUSES WRECK

SOME time ago, a truck operator parked his lift truck near an elevator while he performed another operation. A fellow employee, working nearby, decided that the truck was in his way, and though he was unfamiliar with such vehicles, determined to move it anyway. He wound up in the elevator shaft with the truck and was seriously injured. No worker should be allowed to operate any machinery without proper authorization.



WELDING SPARKS MEAN TROUBLE

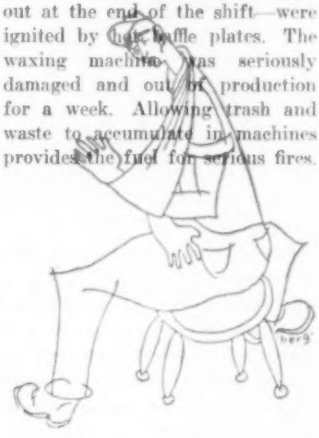
IT was a small job, installing a guard around a steam pipe. A welding permit was issued and asbestos blankets were put in place, but this once, no fire watcher was assigned to the floor below. A welding spark dropped through an opening around the pipe and landed on bales of burlap. Plant and public firemen had to use hose streams and tear the piles down. Water also wet more than two hundred tons of baling wire and many hundred nail kegs. This could have been avoided had the welding permit system been followed.

HANDS OFF!

A CABLE cutter slipped while being held for a pipe liner to cut the steel by striking it with a sledge hammer. The employee who replaced the cutter put his hand on top of it. Before seeing the hand in this dangerous position, the man wielding the hammer was poised for another swing and did not have time to stop the blow completely. The hammer struck the hand of his partner, breaking a bone and bruising several fingers. This accident could have been avoided by proper working co-ordination between the two employees involved. When cutting cable, get in the clear before the cutter is struck. The striker should always watch his helper's position.

POOR HOUSEKEEPING STARTS BLAZE

POOR housekeeping is blamed for a recent fire at a Mid-Western paper cup plant. Two hours after the watchman had started the gas-fired heaters on the waxing machines for the day shift, one of the machines was discovered in flames. The fire had evidently begun when an excess accumulation of spoiled cups at the bottom of the machines—normally cleaned out at the end of the shift—were ignited by hot baffle plates. The waxing machine was seriously damaged and out of production for a week. Allowing trash and waste to accumulate in machines provides the fuel for serious fires.



check list

OF PRODUCTS ADVERTISED IN THIS ISSUE

For full details, without obligation, merely check this list, fill in your name and address, and mail to: Service Dept., SAFETY MAINTENANCE & PRODUCTION, 75 Fulton St., New York 7, N. Y.
NOVEMBER, 1950

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☐ Duratex	See inside front cover
☐ Safety Shoes	1
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☐ Air-Fed Hood	3
☐ Resuscitator	4
☐ Industrial Painting	following page 4
☐ Plastic Goggles	opposite page 5
☐ Changeable Copy Signs	5
☐ Safety Flight Boot	7
☐ Eye Safety Program	9
☐ Dry Chemical Extinguisher	10
☐ Non-slip Soles	11
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Stonehouse Stock-Worded INDUSTRIAL GOOD HOUSEKEEPING Steel Signs

THINK
ANY WORDING DESIRED MAY BE PLACED IN THIS BLANK SPACE AT ADDITIONAL COST
NOTICE
EQUIPMENT IN YOUR DEPARTMENT MUST BE THOROUGHLY CLEANED AFTER EACH DAYS WORK
1319
NOTICE
FOR SANITARY REASONS YOU ARE REQUESTED TO HELP KEEP THIS PLACE CLEAN
REPORT ANYTHING OUT OF ORDER
1321
THINK
HELP KEEP DIRT OUT
CLEAN TOILET ROOMS MEAN GOOD HEALTH
IT'S UP TO YOU!
1410
CAUTION
DEPOSIT MATCHES AND ALL SMOKING MATERIAL IN THIS RECEPTACLE
1010
CAUTION
THIS SPACE MUST BE KEPT — CLEAR — AT ALL TIMES
1076
HELP KEEP THIS PLACE CLEAN
911-E
CAUTION
DO NOT THROW ANY MATCHES RUBBISH CIGAR OR CIGARETTE STUBS IN URINALS
1060-A
CAUTION
SPITTING
ON THE FLOOR INTO CORNERS AND OUT OF THE WAY PLACES IS UNLAWFUL UNHEALTHY UNSANITARY AND DANGEROUS IT WILL NOT BE TOLERATED
1013
CAUTION
KEEP AISLES CLEAR
1003-A
CAUTION
DO NOT SCATTER PAPER AND TRASH ON FLOORS
THIS IS YOUR HOME SIX DAYS OF THE WEEK HELP KEEP IT CLEAN
1021-D
NOTICE
DUMP NO RUBBISH - HERE -
1301-A
NOTICE
PUT THINGS BACK IN THEIR PROPER PLACES AND YOU WILL FIND THEM WHEN YOU WANT THEM
1321-A
WASH YOUR HANDS BEFORE LEAVING THIS ROOM
936
UNIVERSAL SAFETY
SPITTING SPREADS DISEASE
DO NOT SPIT
IF YOU MUST USE CUSPIDOR
2201
ALL HANDS ARE REQUESTED TO
HELP KEEP THIS PLANT SAFE AND CLEAN
906-A
UNIVERSAL SAFETY
SPITTING ON FLOORS AND STAIRWAYS MUST BE STOPPED
2216
NOTICE
HANG CLOTHING IN LOCKERS DON'T LET OLD CLOTHING OILY WASTE RAGS OR PAPER ACCUMULATE IN LOCKER FLOORS PLACE ALL REFUSE IN THE CONTAINERS PROVIDED
1327-A
MAKE ORDER AND CLEANLINESS A HABIT
912-M
PRACTICE
GOOD HOUSEKEEPING
A PLACE FOR EVERYTHING
---AND---
EVERYTHING IN PLACE
972-L
PUT LUNCH SCRAPS IN REFUSE CANS
913-M
NOTICE
POSITIVELY DO NOT THROW ANY WASTE OR RUBBISH OF ANY KIND IN TOILET.
1352-B
CLEAN UP
AND
KEEP CLEAN
919-B
OILY WASTE & RUBBISH MUST BE KEPT IN CANS FOR THAT PURPOSE
169
CAUTION
KEEP ALL TRASH PICKED UP AND PLACED IN THIS RECEPTACLE
1062-A
SAFETY FIRST
PLEASE DO NOT SPIT ON THE FLOOR
426
GOOD HOUSEKEEPING
IS THE
KEYNOTE TO SAFETY
CLEANLINESS ORDER AND A PLACE FOR EVERYTHING
ARE ESSENTIALS OF
SAFETY
914-M
SAFETY FIRST
HELP KEEP THIS PLANT SAFE AND CLEAN
487
CAUTION
DO NOT THROW RUBBISH INTO TOILET BOWLS PENCILS TOOTH PICKS MATCHES CLOTH ETC PLUG TOILETS
1089-A
SAFETY FIRST
BE CAREFUL
EXAMINE YOUR WORKING PLACE WELL BEFORE STARTING TO WORK
719
SAFETY FIRST
BE CAREFUL
KEEP THIS PLACE CLEAN AND ORDERLY
772

Our complete Catalog No. 9 free on request

"Signs Since 1863"

Stonehouse **SIGNS, Inc. Manufacturers**

Stonehouse Building · 9th at Larimer · Denver 4, Colorado · AComa 2202

for industrial *First Aid*

MERCUROCHROME*

H. W. & D. BRAND OF MERBROMIN, DIBROMOXYMERCURIFLUORESCEIN SODIUM)

Do not neglect wounds, however small; even scratches and small cuts may become infected if they are not promptly and properly treated.

'Mercurochrome' (H.W. & D. brand of merbromin, dibromoxymercurifluorescein-sodium) is one of the best antiseptics for first aid use. It is accepted by the Council on Pharmacy and Chemistry of the American Medical Association for this purpose.

The 2% aqueous solution is not irritating or toxic in wounds; minor injuries are reported more promptly when 'Mercurochrome' is the routine antiseptic, because treatment is not painful.

'Mercurochrome' solution keeps indefinitely; the color shows where it has been applied.

Physicians have used 'Mercurochrome' for more than 28 years.

Be sure to include 'Mercurochrome' in your first aid supplies.

*Reg. U. S. Pat. Off.

HYNSON, WESTCOTT & DUNNING, INC.

HW&D BALTIMORE, MARYLAND